

Alan J. Nussbaum

Caland's "Laws" and the Caland
system

Diss. Harvard 1976

NUSSBAUM, *Caland-System*

Inhalt

1. Caland's "Law"	1
2. The central members of the Caland system	6
a. The central adjective-forming members	6
b. The central members of the Caland system not forming adjectives	44
3. The marginal members of the Caland system	56
<i>-mo-</i>	57
<i>-no-</i>	60
4. Suffixal interactions within the Caland system and the formation of complex suffixes	62
5. The Caland System and secondary formations	97

Wortindex

griech. πλους 39	-i-no- 74ff.
griech. κρέων 'Herrscher' 104f.	-ne-s-/no-s- 73f.
griech. πυκνός 'dicht' 61, 88	s-Stämme 70
idg. *leip 'to smear' 106	-u-i- 108
idg. *tek ^w 'laufen' 43	-u-i-ont- 68
lat. nūdus 90	-u-no- 74
lat. spēs 104	-u-ro/lo- 69
lat. tenuis 108	-u-s- 70f.
lat. vetus 71, 104	idus-Suffix (lat.) 89
sogd. wšny (PrIr. < *uatu-š-a-na-) 71	no-Suffix 73
ved. nagná- etc. 92ff.	r/n-Stämme 111
ved. rudh-i-rá- 64	u-Stämme

Schwebeablaut 80

s-Stämme 44, 66, 77

Schwebeablaut 82

Sachindex

bho-Suffix 87

Ved. krátu- etc. 14, 79, 85

Complex suffixes 62

 einzelsprachl. 67, 71

 -i-dho- 97

 -i-mo- 76

1. Caland's "Law"

In 1892 (KZ 31 267-8) W. Caland noted that in a number of cases in Avestan, adjectives in -ra- replaced this suffix by -i- in composition. Some examples given by Caland himself are:

<u>tiṣ-ra-</u> "sharp"	: <u>tiṣ-ii-aršti-</u> "with sharp spear"
	<u>tiṣ-i-sruua-</u> "sharp-horned"
<u>dərəz-ra-</u> "strong"	: <u>dərəz-i.raθa-</u> "with a strong wagon"
Skt. <u>śvit-ra-</u> "white"	: <u>spit-i-dōiθra-</u> "white-eyed"
Skt. <u>sthū-rá/sthū-lá-</u> "firm":	<u>stuu-i.kaofa-</u> "firm-humped"
<u>xrū-ra/krū-ra-</u> "bloody"	: <u>xruu-i.dru-</u> "with bloody club"

In KZ 32 592 Caland proposed that the -ro-: -i- replacement rule was Indo-Iranian in date on the basis of the Sanskrit pair turá- "wild": tuvi-grīva- "strong-necked". This particular example is, of course, incorrect since turá- is from the root terh₂- "overpower" (e.g. Hitt. tarh-u-zzi, Skt. túr-v-ati) and reflects trh₂-o- while tuvi- is from the root of távīti "is strong" (teuh-) and reflects tuh-i-. But the other example in this article is correct and demonstrates the pattern: "Ist vielleicht ursprünglich dasselbe Verhältniss zwischen a.i. gukra- und guci-?"

That the -ro-: -i- replacement pattern is IE was shown by Wackernagel (Vermischte Beiträge, 8ff.). He points to a set of Greek bahuvrihi compounds in ἀργι- "bright" (ἀργι-κέραυρος, ἀργι-πους) where the ἀργι- belongs etymologically with ἀργενρός, ἐν-αργής and the Homeric adjective ἀργός "bright". This -i-

form is reminiscent of the I-Ir. -i- forms pointed out by Caland to which Wackernagel adds the Avestan examples jaiβi-vafra- "with deep snow": cabhīra- "deep" (already mentioned in note 2 in Caland's KZ 31 article) and namii-asu- "with flexible shoots": namra- "flexible" (also already mentioned by Caland - Göttingische Gelehrte Anzeigen 1893, 398 - in a review of Jackson's Avesta Grammar) as well as some Sanskrit ones (e.g. śviti-pad- "white-footed": śvitra- "white").

What is to be compared especially, Wackernagel goes on, is rji-śvan- with first member the -i- correspondent of rjra- "shining, bright". This rji- equals αργι- exactly and thus ἀργο- = rjra- with dissimilatory loss of the second -r-.

The Caland rule is thus IE on the basis of the exact agreement between Greek and Indo-Iranian upon an obviously isolated and unmotivatable morphological peculiarity for which there is even at least one exact word equation. Other Greek examples given by Wackernagel are κῦδλ-άνειρα (along with such personal names as κῦδλ-κλήης, κῦδλ-μένης etc.): κῦδρός, Hom. λαθλ-κήδης : λάθρη, χαλί-φρων : χαλαρός, and others.

But it was also clear from the very beginning that this phenomenon was not limited to -ro- and -i-. Caland specifically mentions -mo- (Skt. tiomā-) as another suffix that can be replaced by -i- (tiži-) as well as -ont- (bərazant- "high" vs. bərazi- in compounds) and also points out that comparatives (type śocīyas- to śukra-) show what is basically the same pattern. Wackernagel in addition includes -u- in the roster

of suffixes with -i- replacements (rju- "straight on": rji-pya-, epithet of the eagle; θακύς : θακι-κλής) as well as -no- (πυκνός : πυκι-μήδης) and compares the Greek comparatives in -ίων with their counterpart in I-Ir. -īyas, both showing replacement of the adjectival suffix of the positive (type ήδύς : ήδιών). He also points to pairs like ἐχθρός : ἐχθικος¹ but does not note that this is asymmetrical with tiyra- : tiqmá- : tiži-. This will concern us below.

From the time of Caland virtually until the present day², the orientation adopted by IE studies toward this phenomenon has essentially been that of Caland himself: "In der Avestasprache erscheinen häufig diejenigen adjectiva, die im positiv ein stammbildungssuffix -ra oder -ma haben, welches in den gradus comparationis wie in den anderen indog. sprachen wieder wegfällt, in zusammensetzung mit anderen wörtern in der kürzeren gestalt also ohne -ra oder -ma, aber mit einem -i." That is to say it has been considered a suffixal replacement rule virtually unique in IE morphology.

It has, of course, been suspected that behind this apparent archaic synchronic rule lies a diachronic development in which, for example, -i- formations were replaced by -ro-, -u-, etc. in simplicia but preserved in the compounds (and comparatives). This is essentially the view of Hirt (Indo-germanische Grammatik 3.274). A more extreme form of this view is held by F. Bader (La formation des composés nominaux du latin, 18 ff.) in which the -i- form is a morphological

element which is a remnant of 'pre-inflectional' IE morphology, the marker of a 'cas indéfini'.³ Whether some such view is or is not correct is almost irrelevant. For although one is free to suspect it one cannot actually reconstruct it. The comparative method, of necessity, can only recover the stage at which Caland's "Law", whatever its ultimate starting point, was already a practically unique synchronic rule by which an adjective in -ro- (etc.) is said to "replace" its -ro- by -i- under some conditions. This is where most scholars have left the matter - and rightly so as far as it goes. In any case, the point to be made is that the process has usually been envisaged as one in which -i- replaces these other suffixes with the result that -i- has become the touchstone of the Caland phenomenon as a whole. It is this outlook which needs to be somewhat modified. In the first place -i- (beside -ro- etc.) is as we shall see by no means confined to compounds and comparatives. So, e.g., it is impossible to separate Hittite harkiš "white" from the rji-, ἀργε- that occurs, as Wackernagel noted, in Skt. and Greek compounds. At the same time it is perfectly legitimate to speak of the Caland phenomenon in cases where -i- plays no role. Thus the -u- stem of such forms as OIr. il, Goth. filu (pelh₁-u-) "much" vs. the -ro- of L. plērus "(very) many", πληρό(ω) "fill" (pleh₁-ro-) is just as characteristic of the Caland suffix alternation as -i-i-ro-. In short it will appear that the notion of Caland's "Law" in which an -i- replaces any one of

a series of suffixes and thus assumes a position of central (and inordinate) importance should be replaced by the notion of a "Caland System". In such a view a root like dhebh- "small", for example, will be said to have parallel derivatives in -ro- (Skt. dabhra-), -i- (dabhīti- < dabhi-iti-) and -u-⁴ (Hitt. tepu) all equally primary⁵ and derived more or less simultaneously (in the most remote synchrony which we can actually recover) as an immediately possible set, one formation potentially implying the others, whatever the starting point of this implication.

We may perhaps conjecture that originally the various adjectival formants involved (-u-, -i-, -ro-, etc.) were functionally distinct in some way and this might be in turn related to the few distributional characteristics still discernible (e.g. -i- occurs more often in compounds than in simplicia). But even if this is so it is clear that these functions had merged more or less entirely already in PIE so that such conjectures remain just that.

In any case, what sets the Caland system apart from other derivational families discernible in the IE languages is the statistically significant number of roots which in fact make sets of derivatives with the closed set of Caland suffixes. By way of contrast, for example, from ues- "don" (RV váste etc.) are derived a ues-mn "garment" (RV vásma, Gr. ἔμα / ἔμμα) and a ue/os-ti- (uestis, Goth wasti). But one cannot speak of a -mn/-ti- "system" in the sense in which

one speaks of a -ro-, -i-, -u- etc. system because, even though ues-mn and ues-ti- are virtually isofunctional (as are, e.g., dhebh-ro- and dhebh-u-) the pattern does not repeat itself in a significant number of cases. For ues-mn/ues-ti- we must speak of a -men- derivative which just happens to occur beside a basically independent -ti- derivative with none of the mutual implication that characterizes the Caland system.

2. The central members of the Caland system

a. The central adjective-forming members

As will become clearer below, the series of adjective-forming suffixes which descriptively belong to the Caland system can be divided into a group of "central" and more "marginal" members of the system according to criteria which will be developed later on. It will be simply stated now and justified later that the major adjective-forming members are, not unexpectedly, exactly those which attracted the most attention from Caland and Wackernagel in the first instance: -ro-, -u-, -ont-, and -i-.

As one might expect, many of the roots displaying a well-developed Caland system are those which have inherently adjectival semantics:

teiq- "sharp"

Av. tiyra- "sharp", ti[~]zi-, u- stem in Irish tiug- (<tiq-u-) "end, extreme, last" occurring in compounds like ti[~]ng-

flaith "last ruler". For the semantics cf. Greek ἀκρὸς
"highest, extreme" < h₂ek- "sharp"

dhreĉh- "strong"

Av. dərəzra-, dərəzi.raθa-

ġueit- "white, bright"

Skt. śvitrá- (AV), śviti-pād- "white-footed"

dhebh- "small"

Skt. dabhra-, dabhīti- (< dabhi-iti-), Hitt. tep-u-

q^(w)embh- "deep"

Av. Yafra-, Yaiβi-vafra- "with deep snow"

ōk-/ (āk?) - "swift"

Skt. āśu-, Av. asu-, Gr. ὤκυς, a well-attested u-stem. The
-ro- by-form is assumed for OCS jastreby, RCS jastrabŭ, etc.
"hawk" reflecting ōkro- or ākro- with the formant of OCS
golobŭ "dove", Latin columba "pigeon" etc. and cf. Hom.
ὤκυ-πτερος, RV āśu-pátvā (śyenáh). (Meillet MSL 11 185-6,
Berneker, SEW, 32). The -i- stem appears, as expected, in the
comparatives Skt. āśīyān, Av. āsiia, Latin ocior, and also
perhaps in Skt. āśi⁶-viṣa- (AV), a poisonous snake (originally
"with swift poison" presumably - W-D AiGr II.1.60).

Latin accipiter "falcon" is also referred to this group
(see Ernout-Meillet s.v., but also Walde-Hofmann) and may be
interpreted to show -i- vs. -u- in acu-pedius (P.F. a.dicebatur
cui praecipuum erat in currendo acumen pedum), although both

cases are ultimately phonologically ambiguous. accipiter (despite Walde-Hofmann) is hard to separate from Hom. ὤκυ-πτερος and RV āśu-pátvā and the deformation of the first member of the compound is likely enough to be explained by folk etymology to accipere, as is standardly assumed (Caper GLK VIII.107.8: accipiter, non acceptor).

The first member might, as Meillet seems to think (MSL 11 185-6), represent āci- (so also Bader, op. cit., passim) even without the obvious influence of accipere (see Sommer Hdb. §118.3) since there are a number of examples of VC > VCC:

Lītera (LEITERAS CIL I² 583₃₅ 123-2 BC) > Littera

(LITTERAS CIL I² 588₁₀ 78 BC)

Cīpus (CEIP(om) CIL I² 5) > cīppus

iūpiter (< dieu-pater) > iuppiter

lītus beside littus

The association of a putative āci-piter with accipere would in this scheme merely contribute to a phonological tendency which is to be recognized in any case. But it would have to be a special conditioning factor since this is the only example in which the vowel is not i or u. Therefore āci-piter seems at best a possibility, in no way preferable to an original āci-piter. In fact, āci-piter may find some support in the fact that the P.F. gloss quoted above folk etymologizes acupedis (whose first member is almost surely identical at least in root etymology to that of accipiter) with ācumen

pedum rather than, e.g. ācritas or ācritudo pedum.

The second member of the compound accipiter is not easy either. aci-petri- with a compositional -petri- (type inermis) corresponding to, e.g., Skt. pātra- is far preferable to assuming an isolated anaptyxis for an aci-pteri- with compositional -pteri- corresponding to πτερόν. This would presume that the nom. *aci-petris > acipetr̥s > acipeter(r) > acipiter (i.e. medial vowel weakening follows -r̥vs# > -r(r)), which can't be absolutely disproved. In the very earliest inscriptions CIL I² 1-5 neither has happened: SAKROS (1), NVMASIOI (3), but when the evidence resumes both have). Thus the genitive aci-pitris, dat. aci-pitri etc. would have the -pit- of the nominative analogically while Plautine acipetrīna (v.l. -pitrina) "thievery" preserves the original vocalism. But integer, integrum shows either that the analogical levelling in this morphologically parallel and contemporaneous case went exactly the other way around or that -r̥vs# > -r(r)# followed medial vowel reduction (*n̥-taeros > entegros > integrs > integer).

If both -pteri- and -petri- are problematical to some extent, however, there is a third possibility. Hittite has an r/n stem from this root meaning "wing": NA sg. pattar, G pl. paddanaš. If the second member of acipiter is referred to this formation (with its probable e root vocalism on account of aci-petrīna) we may conclude an original paradigm of the type pót-r/pét-n-s ~ pet-én-. The morphologically identical

*(h)óuhdh-r/(h)éuhdh-n-s ~ (h)uhdh-én- is perhaps instructive for the Latin developments. The Latin reflex is of course Über which has undergone two major secondary developments: 1) the e vocalism of the oblique n-cases (-en-) has been extended to the r-cases (-er cannot of course reflect -r cf. iecur), as also, incidentally, in the case of iter (original paradigm éi-tr/i-tén).⁷ 2) the r/n alternation has been replaced by -r throughout. If we start with an *aci-peter⁸ with the root shape of the oblique cases generalized (as also possibly in Über although the case is totally ambiguous⁹; but certainly in the indirect morphological parallels ĭ-ter and iēc-ur) and with a secondary -er (as in uber) in the nominative and an *aci-petres in, e.g. the genitive either by early syncope from ĭci-pĕtĕrĕs or by analogy to the only other animate -ter stems in the language - the pater, frater, mater series, the difficulties disappear.

At stage one we have *aci-peter/aci-petr-es vs. *entacros/entagrom. With the medial vowel weakenings aci-piter/aci-petr-es vs. integros/integrom. Only then does the -r̥vs > -rs > -er(r) rule operate thus giving integer with no analogies required. At any stage after the medial vowel treatments which produced acipiter/acipetr- the analogical extension of -pit- from the nominative is free to take place (while -petr- is presumably preserved in aci-petrīna). This interpretation at least makes it possible to explain acipiter and integer without contradicting ourselves and may at the same time constitute some

grounds for dating the Latin $-\check{r}\check{v}s > -er$ rule later than the medial vowel reductions.

In any case, acipiter vs. acupedius may or may not furnish an $\check{a}ci-$ vs. $\check{a}cu-$ Caland pair but do probably furnish an $\check{a}\hat{k}-$ vs. $\bar{o}\hat{k}-$. This is ambiguous for the reconstruction of the shape of the root for "swift" however ($h_3\bar{e}\hat{k}-$ vs. $h_3\hat{k}-?$, $(h_1)\check{e}h_3\hat{k}-$ vs. $(h_1)h_3\hat{k}-r$). It does appear to rule out what would otherwise be a perfectly possible preform for (late IE) $\bar{o}\hat{k}u-$, though; namely, $h_3e-h_3\hat{k}u-$ with the structure of bhe-bhr-u- (Skt. bēbhrú-, Gmc. bebrú-) "brown; beaver" since reduplicating syllables are as a rule not subject to e/zero apophony and $h_3e-h_3(\check{e})\hat{k}-$ would yield a constant $\bar{o}\hat{k}-$.

h₂erǵ- "bright"

-ro- in Skt. ṛirá-, Gk. ῥιρός ($\check{z}\check{a}\rho\rho\acute{o}s$)¹⁰

-i- in Hitt. ḫarkiš "white". As "Caland -i-" in ṛjī-śvan- PN (cf. ῥιγίπιδας κύνας ?), ṛjīti- (<ṛjī-iti->), ṛjīkā- "with white, shining appearance, foam" < h₂ṛǵi-h₃k̂-u- (on Toch A ārki see below).

-u- pre-supposed by ῥιγυ-πος, ῥιγυ-φος, Skt. arju-na- (more on which below). u- stem denominative derivative probably in arguo¹¹ (aroutus also suggests denominative origin) "make clear, elucidate".

-ont- in the various words for "silver": Av. ərəzata-, L. argentum, OIn. argat (only later aircet), W. ariant all reflecting h₂(e)ṛǵ-nt-u-. Skt. rajatá- presents Schwebeablaut

problems in the root¹² (see Anttila § 9.4) but clearly belongs here as far as the *-nt-o- formation is concerned. Armenian arc^hat "silver, gold" is still more problematic. Cf. erkat^h "iron"?

apparent "root" *kūd- "famous"

The famous pair κυδρός κυδρ-άειρα

bherǵh- "high"

-ro- in Toch. A pärkär B parkre (both reflecting *bhrǵh-ro-)
-ont- in RV brh-ant- Av. bərəz-ant-. Also attesting this widespread bhrǵh-ont- are the (originally divine) name Bridit in Irish (<*bhrǵh-nt-ī = e.g. Av. bərəzaitī) and the Germanic Burgund- names (bhrǵh-nt-). In Tocharian we have a compound meaning "sunrise, the East". The forms are:

Toch A. nom. <u>kom-pärkānt</u>	Toch B. nom. <u>kaum-pirko</u>
dat. <u>kom-pärkāntac</u>	abl. <u>-pirkomem</u>
derived adj. <u>kom-pärkāñci</u> in	derived adj. <u>-pirkosse</u>
fem.obl. <u>kom-pärkāñcām</u>	

No doubt the original stem is to be identified with that of bərəz-ant-, etc. (on its non-adjectival function see below) and *bhrǵh-ont (or bherǵh-ont) the proximate pre-form in the nominative. B -pirko would seem to represent the regular phonological development of -ont/-onts in final position (cf. B walo) while the A form in -ānt is restored from the rest of the paradigm (cf. A lānt). In B though, this -pirko has been generalized as an invariant nominative-oblique stem

(cf. descriptively B pito?) and thus the B abl. pirko-mem, possessive -pirko-sse.

-i- in Av. barəzi- as above.

-u- in Hitt. parkuš "high" Arm. barjr, barju (bhrôh-u(r)) "id".

keuk^(ω) (maybe IIr. only- Greek ΚΥΚΝΟΣ "swan" very unsure)

-ro-/-lo- in śukrá- (RV), śuklá (AV), Av. suṣra- "bright"

-i- in śuci- "bright"

dueh₂- "far, long, long (lived)"

dueh₂-ro- in δῆρός "long", Arm. erkar "long" but duh₂-ro- in L. dūrus, Skt. dūrā- "far", Av. dūrat "from afar".

OIr. doē "slow", pl. doī seems to represent a secondarily thematicized duoh₂-i-; duoh₂-i- > duoi- and duoi + o- > duoio- > doē.

Greek δαόν could similarly reflect dueh₂-i- > duai- and duai + o- > duaio- > δαόν. But dueh₂-o- is of course possible too. Only the parallelism of the Irish form and the general extreme rarity of thematic adjectives with e root vocalism beside a Caland system support dueh₂-i + o-.

Hitt. tūua, tūuāla- also belong here (Benveniste BSL 33, 142) but the non-preservation of h₂ in tūuāla- requires some explanation (model of dūua where the -h₂ could have been in final position?). If so tūua-la- would be a formation parallel to δῆρός, erkar.¹⁴

h₁reudh- "red, blood(y)"

The well-known forms are of the type:

-i- in RV rudhī-krā- PN "Blutausstreuend" (W-D AiGr. II.1.61, Mayrhofer KEWAi sub rudhirā-) and indirectly in rudhī-rā- as well.

gr. ἐρυθ- Szemerényi
Rsch

-ro- in ἐρυθρός, ruber Toch A rtār B ratre, Iranian *rudra- in Sogdian rwz- (Szemerényi BZ N 2, 175f.), etc.

The u-stem is lacking in accordance with Bloomfield's restriction (Language 1, 88ff.)

dens-l "wise, wondrous"

RV das-rā-, Av. daŋ-rō with -ro- beside the -i- of δαί-φρων. dāmsu (RVI, 134, 4 and 141,4) might mean "in wondrous wise" and if so would belong here. But the word has also been interpreted as loc. pl. of dām- "house" (see Mayrhofer with references to Geldner, Rendu). Even less clear is the analysis of damsu-jūta-, damsu-patnī-.

kret- "strong"

Caland system within Greek: κρατός, καρτερός / κρατερός, κρατι-σθένης. Gmc hardu- (e.g. Goth. hardus) reflecting kort-ú-¹⁵ has schwebeablaut and o grade and is reminiscent in both respects of Gr. πολός (see below).

RV krātu-, Av. χratuś are nouns and not adjectives but the -u-formant ultimately has to do with this Caland system (see below) p. 79, 85

mak- "long, thin"

-ro- in macer, μακρός (on Hitt. maklant- see below)

-i- as expected in Av. comparative masi-ia.

Other typical Caland-system formations on this root below.

$h_2ek\hat{-}$ "sharp"

-ro- in $\acute{\alpha}\kappa\rho\acute{o}\varsigma$, OIr. $\acute{e}r$ "high, noble" (cf. the Greek correspondent for the semantics) OCS $os(t)r\ddot{u}$ etc.

-i- in Gr. $\acute{\alpha}\kappa\acute{\iota}\varsigma$ ($\alpha\kappa\text{-}\iota\text{-}\delta\text{-}$) "needle, splinter, barb, etc.," and indirectly elsewhere (see below).

-u- adjective in Latin acus (cf. Plaut. acu rem tangere in which acu probably means "sharply") so that acus "needle" would seem to be a substantivized adjective. Further the derivatives acuere "sharpen" and acumen "sharpness" point to an acu- "sharp". Also Latvian ass "sharp" probably < Baltic *asu- and cf. Lith. asu-taĩ "stiff horsehairs" and OCS osŭ-tŭ "τρίβολος".

This root furthermore makes a large number of more complex formations typical of a root with a well-developed Caland system (see below).

The root vocalisms shown by the whole complex of derivatives include $\acute{a}\hat{k}\hat{-}$ ($\acute{\alpha}\kappa\rho\acute{o}\varsigma$ etc.), $\bar{a}\hat{k}\hat{-}$ (L. acer - see below), and $o\hat{k}\hat{-}$ ($\acute{\omicron}\kappa\rho\iota\varsigma$, ocris, etc. - see below) which seem to point to $h_2ek\hat{-}$, $h_2ok\hat{-}$, $h_2\acute{e}k\hat{-}$. Purely within the system of Caland derivatives from this root it would seem at first glance that the -u- stem paradigm (and only the -u- stem paradigm) could have had all three vocalisms if one assumes an original acrostatic $h_2\acute{o}k\hat{-}u\text{-}/h_2\acute{e}k\hat{-}u\text{-}$ with a new $h_2\acute{e}k\hat{-}u\text{-}$ produced in place of $h_2\acute{o}k\hat{-}u\text{-}$ on the basis of the ambiguity

of the weak cases in $h_2\acute{e}\hat{k}-u-$ (or the reverse beginning with $h_2\acute{e}\hat{k}-u-/h_2\acute{e}\hat{k}-u-$ and leading to a new $h_2\acute{o}\hat{k}-u-$). An exact parallel would be provided by $h_1u\acute{e}\hat{s}-u-^{16} \sim h_1u\acute{o}\hat{s}-u-$ (e.g. Irish fíu beside fó)/ $h_1u\acute{e}\hat{s}-u-^{17}$. Thus produced, the three variant vocalisms could be assumed to have each been generalized to the other formations in the Caland system ($\acute{a}\hat{k}-$ would of course be well represented outside the $-u-$ stem paradigm already). But this explanation is at least partly improbable because L. acer, the only good evidence for $\acute{a}\hat{k}-$ within the Caland system ($\eta\acute{\kappa}\acute{\epsilon}\varsigma \cdot \omicron\acute{\zeta}\acute{\upsilon}$ is compositional), is almost sure not to have its $\acute{a}\hat{k}-$ from the $u-$ stem paradigm. In the first place $\acute{\alpha}\kappa\rho\acute{o}\varsigma$ acer is matched by sacer (sakros): sacer ($\acute{s}\acute{a}kris$) while there is no $-u-$ stem to sak- so that the assumption of $\acute{a}\hat{k}-$ from the $u-$ stem paradigm is at least unnecessary. Furthermore the lengthened vocalism of both sakri- and akri- seem to be an inner-Latin matter to judge by the fact that Oscan consistently has sakri-, never $*\text{saa}kri-$ in 6 occurrences and has akrid the one time it occurs, although this is less conclusive inasmuch as it is a hapax and may not even reflect a real $-i-$ stem since it is simply an adverb. But O. sakri- is in any case enough to show that Lat. sakri- probably has vocalism lengthened within Latin¹⁸ and this should make akri- open to a great deal of suspicion.

Furthermore, if the $\acute{a}\hat{k}-$ vocalism of acer is supposed to have originated in an (acrostatic) $u-$ stem paradigm it is a serious embarrassment that the $-u-$ stem formations from

this root - including that of Latin ŷacu- itself-consistently show ăk̂- (or ok̂-). In short the vocalism of Latin acri- (and sacri- for that matter) is enigmatic but probably not inherited and localizable in an acrostatic u- stem paradigm. The ok̂- vocalism is somewhat less improbably taken as having been generalized from a h₂ók̂-u- since the ambiguity of the Balto-Slavic forms in *asú- means that ok̂- cannot absolutely be ruled out of the -u- stem formations that are found. But, as we shall see, there are a number of good examples of Caland system formations showing o root vocalism for which the assumption of an acrostatic ó/é -u- paradigm is at least totally unsupported. In short the multiplicity of vocalisms shown by the h₂ek̂- root in its Caland system (ok̂-, ak̂-, ak̂-) remains problematical and may turn out to be explainable only case by case if at all.

dheubh- "dark"

A small but clear Caland system constituted by Greek τυφλός "blind" (*dhubh-lo-) vs. OIr. dub "black" (*dhubh-u-). The Greek form is an example of -lo- as the equivalent of -ro- within the Caland system (of which there are many examples) and the Irish form is one of a small number of exceptions¹⁹ to Bloomfield's restriction - the tendency for roots containing -u- not to make u- stem adjectives.

dheub- "high, deep"

Beside thematic dheub-o- (e.g. Goth. diups), this root has

a Caland system constituted by Lith. dubùs (dhub-u- another exception to Bloomfield's restriction) beside Latv. dubra "pit" (insofar as this may be considered a substantivized adjective, as is fairly likely in a root with adjectival meaning). Toch A tpär B tapre (C. Toch. täpra-) reflect dhub-ro- and thus supply the -ro- formation to this Caland system.

ġerh₂- "old, feeble"

-ro-/-lo- in γερὰ-ρός "venerable", Gmc. *karlaz "(old) man", an example, in its root vocalism, of the o "interference" which was mentioned above in connection with ok- forms of the "sharp" root. The -u- stem correspondent is continued directly by γραῦς (indirectly elsewhere as well - see below). This paradigm is based (in Greek) on an invariant γρᾶF- which can only have been the original stem form in the oblique cases. Thus gen. (e.g.) ġrh₂-u-és > grāu-és and with *grāu- generalized to the nom. grāu-s (Hom. γρᾷς). The oblique *ġrh₂-u- in turn probably points (see below) to an original amphikinetic paradigm (*ġerh₂-ou-/ġrh₂-u-és) to which Avestan *nasaus²⁰ "corpse" (nék-ou-s) provides an exact formal parallel. We shall return to these forms later in the discussion of the inflectional types of the u-stems of the Caland system.

An -ont- formation is also well-known here: Gr. γέρων beside RV jarant-/jurant-. Now jarant- occurs beside a present jarati but is not functionally the "present participle"

of this verb at all. járatī is transitive (and thus the creation of a formal "causative" participle jārayant- beside járatī in this transitive value) while jarant- is intransitive (see W-D AiGr. II.2.163f.). This taken together with the fact that no ǵerh₂-o- present occurs in Avestan, nor in Greek beside γέρων, suggests at the very least that ǵerh₂-ont- is simply not the participle of a putative present ǵerh₂-o- diachronically speaking and never was. The case is parallel to brhant-/bərəzant-, an -ont- adjective, as we have seen, which is widely attested in the IE languages, beside brhatī which is confined to Indic, has a transitive force, and is not attested in RV at all. In both cases we are dealing with primary adjectives in -ont- beside -u-, -ro-, and -i- within a Caland system and having nothing direct to do with the verbal system.

Similarly jurant- occurs twice in the early books of the RV while juráti (RV hapax) occurs in Book I only - leading one to suspect that jurant- and jarant- are allomorphic doublets both going back to a single jarant-/jurit- (ǵerh₂-ont-/ǵrh₂-nt-(és)) paradigm with juráti back-formed to jurit-. And it is interesting to note that no jur-ant- forms actually exist in RV - only jur-at-.

The most common RV adj. from the ǵerh₂- root is actually a-jūrya- (once a-juria- trisyllabic) whose root vocalism indicates that whether the actual development to be assumed is ǵrh₂-i- > juri- then + -a- > jūria- or ǵrh₂-i-io- in the

first place (the first more likely in such a clear Caland root and cf. the parallel of Greek $\delta\alpha\acute{o}\gamma$ and Irish doḡ above), we should assume as the starting point the i-stem adjective also found (in recharacterized form) in Avestan zairi-na- (a type to be discussed below).

For the root derh₂- we therefore have a complete Caland set: -ro/lo-, -u-, -ont-, -i-.

pleh₂- "flat, broad"

Hittite palhi- vs. OIr. lár (pleh₂-ro-/plh₂-ro-) "surface"
W, llawr if these are substantivized adjectives for "flat."

mel(h₂) "black"

Greek $\kappa\acute{\epsilon}\lambda\alpha\varsigma$, $\kappa\acute{\epsilon}\lambda\alpha\iota\nu\alpha$, $\kappa\acute{\epsilon}\lambda\alpha\nu$ has been interpreted (Schwyzer Gr, Gramm. 490, IF 30 446ff.; Brugmann Grdr² 2.1.256 note 1) as an original $*\kappa\acute{\epsilon}\lambda\alpha\nu\omicron\varsigma$, $\kappa\acute{\epsilon}\lambda\alpha\iota\nu\alpha$, $*\kappa\acute{\epsilon}\lambda\alpha\nu\omicron\nu$, comparable to Skt, malinā-, malinī but reinterpreted as an n-stem on the basis of $\kappa\acute{\epsilon}\lambda\alpha\iota\nu\alpha$. But in the first place, as Frisk II.198-9 points out, the Sanskrit side of the equation is useless for comparison since malinī is attested only lexicographically (and in the meaning "menstruating woman") and malinā- is in addition only epic and classical, where it is clearly a late derivative of māla- "dirt" (W-D AiGr II.2.351f.)

In the second place melh₂-n-ih₂ as feminine of melh₂-no- is very unlikely in Greek in the first place since Greek simply doesn't have the "vrkī- type" (i.e. -ih₂- feminine to -o- masculine²¹), as is quite clear from Schwyzler's own

survey (Gr. Gr. I.473-6) of Greek -ιᾶ formations. They are virtually limited to athematic corresponding masculines (ἑῖς /μία, ἱερεὺς /ἱέρεια, φέρων /φέρουσα, -γενής /-γένεια, -τηρ /-τειρα and -τρια, εἰδώς /ἰδύλα, τέκτων /τέκταινα, etc.) Even Schwyzler qualifies with "anscheinend" the forms λύσσα "(zu λυκός?)", μοῦρα "(μόρος bzw. μορ - wie φλογ-... oder -ορ - ἄολisch?)" which he lists with justifiable doubts on p. 474.²² Implicit in the very assumption that μέλαινα could be the starting point for a secondary n-stem masculine is the admission that μέλαινα is normal only beside an n-stem, not a thematic *μελανο-, which can only lead one to wonder why μελανο- should be assumed in the first place.²³

Frisk indicates the direction for a better solution in pointing out that the obvious parallel to μέλας, μέλαινα, μέλαν is τάλας, τάλαινα, τάλαν "wobei indessen zu beachten ist dass τάλας ein urspr. γτ- Stamm zu sein scheint" (and compare dative τάλαντι in Hipponax and Frisk II.2.848). Clearly both τάλας and μέλας are original -γτ- stems. In the case of τάλας the derivational history is ambiguous. It could either be the original participle of the root aorist ἔτλη which, having become specialized in the meaning "(long-) suffering, unfortunate" was replaced by τλάς or else it is a primary -nt- adjective belonging in the Caland system of telh₂- along with ταλαρός(?) and τάλαι-(μένης, etc.), with which it agrees, furthermore, in having τάλαι- < telh₂- vs. the τλά- < telh₂- of the verbal forms. For μέλας < μελα-γτ-ς

only the second possibility is open, of course. It can only be interpreted as a primary adjective in -nt-.

Beside this -nt- stem it is perhaps legitimate to see indirect evidence of the corresponding -u- stem in $\kappa\omicron\lambda\acute{\upsilon}\text{-}\nu\omega$ "sully, make dirty". In addition the -ro- stem may be reflected in Albanian mjerë "unlucky" (? < "black" according to G. Meyer Etym. Wörterbuch der alb. Sprache, 283)

sen- "apart (from), without"

$\sigma\epsilon\nu$

An adjectival-adverbial root appearing, on the one hand, in purely adverbial formations (*sn-ter in Ionic $\acute{\alpha}\text{-}\tau\epsilon\rho$ cf. also OHG sun-tar etc.) but sen-u- in RV san-u-tár "away, aside" vs. sen-i- in Latin sine (*seni > sini > sire with the e > i/-ci rule of cinis followed by -i# > -e#) and *snn-i- (Lindeman form cf. NTS 20, 1965 38ff.) in OIr. sain "different, special", Cf. also RV san-i-túh. Toch A sne, B snai "without" furthermore reflect a *sn-ei- (cf. A tre B trai < *trei(es) "three"), perhaps ultimately the oblique stem of an old Caland i-stem adjective. These adjectives may well have been proterokinetic (R(é)-i-/R(z)-éi-) cf. Hittite šalliš, gen. šallaias for the type.

temh- "dark"

Presents -ro- in Skt. tāmra- (YV) which would appear to reflect ultimately tmh-ro- > *tā-ra- with the root shape remodelled to tām- on the model of tām-as, etc. Beside this form is tāmra- (RV 10th Book) apparently still more closely

assimilated to the root shape tam- of tám-as or even made directly on it as an entirely fresh formation. For the peculiar-looking timira- see Kuiper Acta Orientalia 20 (1946) 23-35 although one's confidence in the assumption of "laryngeal unlaut" for this form is not increased by the fact that timira- is a rather late (epic/classical) form. In any case támra- points indirectly to an old -ro- formation *tmh₂-ro- for this root.

The corresponding -i- adjective seems to be continued by OIr. teim (*tem(h)-i-) "dark"

tep- "hot"

-u- adjective in RV tápu- "hot".

-lo- in e.g. O.Russ. teplŭ. On the relation of OCS toplŭ, etc, see Vasmer III.94, Meillet Études 413. teplŭ seems to be the original form of the adjective.

A primary adjective in -ont- is reflected on the one hand by OIr. té, pl. téit "hot" (tepent- < tep-nt-) with no verb beside it (cf. the case of ῥέπων above) and on the other by RV tápant-. As in the cases of brhant- and jarant-, tápant- "hot" has a transitive tápati "heats, burns" beside it. In all three cases the Vedic "participles" differ in function from the presents and the presents are limited as such to Indic while the -nt- formations have exact correspondents elsewhere (brhant- : barazant- etc., jarant- : ῥέπων, tápant- : té), indicating that these -nt- adjectives were

originally independent of the verbal system. Furthermore, and this is what concerns us here, all three of these -nt- adjectives alternate with parallel adjectives in -ro-/-lo- and/or -u- and/or -i-, another characteristic that ultimately places them outside the verbal system.

h₁ues- "good"

An acrostatic u-stem adjective lies behind Ir. fó "good" < uos-u- vs. fíu, W. gwiw "worthy" and RV vásu-, Av. vanhu-/vohu-. Either uos-u- or ues-u- is the product of a switch of acrostatic types but it is not possible to tell in which direction the innovation went.

Toch. B ysu(w)-ar "friendliness" (on the segmentation Krause-Thomas §111.5) also reflects a h₁uesu- with palatalized s taken over from the -i- stem h₁ues-i-, preserved in the derivative A wse = B ysiye, vasi, a euphemistic epithet "goodly, friendly" (cf. ysuwar "friendliness") which has come to be the word for "night".

Thus h₁ues-u-/h₁uos-u- vs. h₁ues-i-

A Caland system limited to Indic is presented by the i-stem dúdhi-, the -ro- stem dudhrá- and the -ont- stem dódhant- (all RV meaning "wild") apparently reflecting an enlarged root dheu-dh- (cf. Hsch. θύσσειν·τινάσσειν?)

In these cases, then, we have a Caland system, a complex of parallel adjectival formations in -i-, -u-, -ro-, and -ont-, derived from roots with more or less adjectival semantics.

But Caland systems are by no means limited to such roots of course. There are many roots either not adjectival at all or not primarily adjectival which show the same derivational pattern:

kreuh₂-

✓ Root noun in OIr. crú, Av. xrū-, Slavic kry (see Berneker SEW, 632 for the various forms) "blood, gore, bloody flesh" which indicates (and see more on this fact below) that the basic semantics of the root are most likely not adjectival.

In any case cf. Skt. krū-ra-, Av. xrū-ra- vs. Av. xruu-ant- (and xruu-ant-a-²⁴=), L. cru-ent-(us), Av. xruui-dru-, Skt. á-kravi-hasta-

sek^x

A verbal root "follow" (sácate, ἑπομαι, sequor etc.) with RV á-sk-ra- "united" vs. saci-víd- "like-minded" (W-D AiGr. II.1.59)

h₃reǵ-

Also verbal (ὀρέγω, rego, etc.) and with the Caland system: rjú-, arazu- "straight (on), correct" (cf. also rju-krátu-, -gātha- etc. in compounds)

-ro- in the I-Ir. compound rjirāśva- (rjira-aśva-) = Av. arəzrāspa- "with horse(s) going straight on" cf. RV 6.37 áśvāḥ ...

r̥jyanto

-i- in rji-pyá-, arəzi-fiia-²⁵ epithet of the eagle (2nd

member unclear) "flying(?) straight on" and in ṛjīti- (ṛji-iti-) "going straight on", which may also belong with ṛjra- "bright", however (W-D AiGr. II.1,59)

✓ ueiq- (vi jāte "hurries, flees")

-ro-/-lo- in RV hapax vigra-, Lith. vīglas, Latv. vīegls "quick" beside -i- in Av. vaēžii.aršti- "with quick lance" (W-D AiGr. II.1,60)

h₂ueq- (beside an enlarged h₂ueq-s- ἀέζω, vaksáyati, Goth. wahsjan, etc.).

The h₂ueq- form of the root has a Caland system constituted by h₂uq-ro- (RV uqrá- "great, mighty" = G.Av. uqrō cf. uqrá-bāhu- = uqra-bāzu-) beside -u- in OPr. aūqus "greedy (for gain)" and Lith. áugu(mas) "growth" which belongs to a series of -ma- abstracts derived from u-stem adjectives (Brugmann Grdr² II.1,250).

The only evidence of the -i- stem is in the comparatives Skt. ójī-yas-, Av. aojī-iah- "greater, mightier".

telh₂- "support, bear" (in both the physical and metaphorical senses) has a primary verbal system with the nasal present t_l-n(e)-h₂- (OIn. tlenaid, Lat. tollo) and root aorist (ἐτλη) but also a full Caland system:

ταλαί-κενης (Hom. PN), ταλαί-φρων "wretched" (Sophocles) with ταλα-ι- replacing ταλ-ι- (t_lh₂-i-) on the model of e.g. κῦδ-ρο- : κῦδ-ι- = ταλα-ρο- : X = ταλα-ι- (and see Wackernagel

Verm. Beitr. 9)

τάλαρος "basket" in and of itself could perfectly well be interpreted as an example of a fairly well represented class of deverbative nouns in -ro-, some of which are, like this one, names of instruments or implements. e.g. ξύρον "razor" (ξύω "scrape") = Skt. ksurá- "razor". If so, it would not belong here in the last analysis.

The -nt- stem is probably continued by τάλας "wretched" (secondarily an n-stem cf. dat. τάλαντι in Hipponax), reflecting tlh₂-nt-s.

OPr. talus "floor (<ground)" shows a u-stem formation and is another example of what we have been calling o "interference" within the Caland system. It is as if it reflected a tolh₂-u- and although an acrostatic paradigm (type h₁uós-u-) cannot perhaps be absolutely ruled out, the assumption is not supported by any additional facts. One may perhaps further compare Skt. tālu "palate" (also maybe "top of the head" see Mayrhofer I.499).

Semantically, of course, OPr. talus is to be put with other words for "earth, ground" that are derivatives of telh₂- "support": OIr. talam(a -men- stem), Slavic tilo (tlh₂-o-), perhaps Skt. tala- (telh₂-o-) "surface", etc. Of importance here is only that it is a u-stem beside the Greek -i- and -nt- formations above.

In Latin, a telh₂-u- seems to be required directly or indirectly by the archaic adverb tolūtīm "on the run"

originally "lifting (the feet)" - see E-M 694, W-H II. 689, although the suggestion "auf Grund einer Wzform *teleu-" is both improbable (since telh₂- simply doesn't occur with a -u- root enlargement) and unnecessary. The derivational history of tolūtim is not, it is true, perfectly clear. But there are only a very limited number of possibilities. Latin has only five adverbs in -ūtim: minūtim (Cato), tribūtim (Cicero), solūtim (hapax in Tertullian), volūtim (Nonius), and tolūtim (Plautus, Lucilius). It is fair to say that -ūtim is not a wildly productive adverbial suffix. In fact it is found only where it belongs - beside -ūtus (minūtus, tribūtus, solūtus, volūtus). There is simply no free-floating -ūtim in the language. It is always derived either from an -ūtus or perhaps (in the case of tribūtim "by tribe" in tribūtim et centuriatim Cicero pro Flacco 7.15) directly from a u-stem. Tolūtim is in fact the most isolated and archaic-looking member of this small group of -ūtim adverbs and it is therefore virtually impossible to assume that it has somehow been made "on the model" of the other four all of which (except perhaps minūtim) are clearly later formations in the first place. There is also the further problem of why tol- would be the stem extracted for purposes of this spreading of -ūtim, since it scarcely appears elsewhere in the language (archaic subjunctive tulam; perfect te-tulī; tolerāre, itself problematic - see below). It is clear that tolūtim is either the replacement of a *tolū, a u-stem ablative in adverbial function

(cf. tribūtīm "by tribe" probably just a reinforced adverbial formation for tribū "by tribe" since it has very little to do semantically with tribuere, tribūtus) or else tolūtīm is derived from a lost *tolūtus which pre-supposes a *toluere which in turn can only be denominative from a u-stem. The first possibility (reinforcement of *tolū) is probably preferable, but in any case tolūtīm requires a u-stem adjective meaning "lifting".

Latin tellūs is also usually said to belong to the set of words for "earth" made on telh₂- "bear, support" (and "lift" cf. OIr. tlenaid "takes, steals") so E-M 679, W-H II.655. But the details of its formation have remained a problem. Once seen, however, that telh₂- makes a Caland system of derivatives (ταλαί-φρων, ταλα-ντ-, possibly ταλαρός) which includes a u-stem (OPr. talus, L. tolū(tim)), some progress may perhaps be made. We have already seen two cases in which a Caland system includes, beside whatever -i-, -ro-, and -ont- formations it happens to make, an amphikinetic -u- stem. Beside νεκρός we have Av. *nasauš "corpse" unambiguously pointing to a paradigm nek-ou-s/(nk-u-és) in the first instance. Greek νέκυς (gen. νέκυος), which functions both as a noun "corpse" and an adjective "dead" may be the exact correspondent of the Avestan form with -ū/-u- having replaced the original -ou/-u- in the suffix (see Schwyzler 463, Kuiper "Notes on Vedic Noun Inflection").

Likewise beside γερα-ρός, Gmc. *karlaz and γέρων,

jarant-/jurit- we have Hom. $\gamma\rho\eta\acute{\upsilon}\varsigma$ (dat. $\gamma\rho\eta\acute{\iota}$), where the invariant stem $\text{gr}\bar{\alpha}\ddot{\upsilon}-(\text{s})/\text{gr}\bar{\alpha}\text{u}-(\text{os}, -\text{i}, \text{etc.})$ can only have originated in an oblique stem $\hat{\text{gr}}\text{h}_2\text{-u-}$. The oblique stem $\hat{\text{gr}}\text{h}_2\text{-u-}$ in and of itself, of course, is ambiguous. It is appropriate both to an amphikinetic (nom. $\hat{\text{ger}}\text{h}_2\text{-ou-}$) and a hysterokinetic (nom. $\hat{\text{gr}}\text{h}_2\text{-}\acute{\text{e}}\text{u}$) paradigm. But the parallelism of nek-ou-s itself should carry some weight. $\gamma\acute{\epsilon}\kappa\bar{\upsilon}\varsigma$ (nek-ou-) and $\gamma\rho\eta\acute{\upsilon}\varsigma$ (proposed as ultimately reflecting a $\text{gerh}_2\text{-ou-}$) are u-stems made from semantically similar roots ("perish" and "weaken" respectively) both of which have well-elaborated Caland systems within which a u-stem formation is to be expected. Furthermore the formal/ semantic parallelism of nek-ou- "dead (body)" to $\hat{\text{ger}}\text{h}_2\text{-ou-}$ "old (woman)" would be complete - all the more so if, as seems practically certain, the restriction of $\text{gerh}_2\text{-ou-}$ to females (as that of $\text{gerh}_2\text{-ont-}$ to men) is a secondary one accomplished only within Greek.

In addition the Hesychius gloss $\gamma\acute{\epsilon}\rho\upsilon\varsigma \cdot \gamma\acute{\epsilon}\rho\omega\upsilon\varsigma$ which, beside $\text{grh}_2\text{-u-}$ ($\gamma\rho\eta\acute{\iota}$), would certainly point to a $\text{gerh}_2\text{-(o)u-}$, is supported by the proper name $\Gamma\acute{\epsilon}\rho\upsilon\varsigma$ attested at least once and perhaps twice (both in the genitive singular $\text{ke-ru-wo-se} = \Gamma\acute{\epsilon}\rho\nu\text{Fos}$) in Cyprian syllabic inscriptions (O. Masson Les inscriptions chypriotes syllabiques nos. 117, 154d). Given that a u-stem is at home in this Caland system in the first place and is assured for Greek by $\gamma\rho\eta\acute{\iota}$ anyway, there can be no objection to interpreting $\gamma\acute{\epsilon}\rho\upsilon\varsigma$ / $\Gamma\acute{\epsilon}\rho\upsilon\lambda\text{o}\varsigma$ as reflecting an original u-stem (cf. $\Theta\rho\acute{\alpha}\epsilon\upsilon\varsigma$ / $\Theta\rho\alpha\acute{\varsigma}\upsilon\lambda\text{o}\varsigma$, $\text{Ἡδ}\upsilon\varsigma$ / $\text{Ἡδ}\acute{\upsilon}\lambda\text{o}\varsigma$) rather

than analogical (Schwyzer Gr. Gr. 1 463) or back (Leumann Glotta 32, 224 n.1) formations.

What is more, it may be doubted that a hysterokinetic $\hat{*}\hat{q}rh_2\text{-}\acute{eu}$ would have the required function. Again the parallel of the derivatives of $\hat{n}ek\text{-}$ becomes relevant. For the neatest way of accounting for the distinction in function between the u-stem $\hat{n}ek\text{-}ou\text{-}$ "dead body" and the u-stem reflected by the Celtic words for "death" (OIr. éc, MW. angheu) is to assume for the latter a collective/abstract $\hat{n}k\text{-}\acute{eu}$ ²⁶ with plural inflection of the oblique cases (thus $\hat{n}k\text{-}\acute{u}\text{-}\acute{om}$, $\hat{n}k\text{-}\acute{u}\text{-}bhis$, etc.), which is not unexpected for formations with collective/abstract value (J, Schmidt Die Pluralbildungen der indogermanischen Neutra, 12ff. and passim). This directly accounts for Irish téit do écaib ("dies" < "goes to death") with écaib directly reflecting $\hat{n}k\text{-}\acute{u}\text{-}bhis$ and suggests that the singular inflection of éc is an innovation while Welsh angheu results from a normalization of the nominative of the paradigm $\hat{n}k\text{-}\acute{eu}$, $\hat{n}k\text{-}\acute{u}\text{-}\acute{om}$, $\hat{n}k\text{-}\acute{u}\text{-}bhis$ to $\hat{n}k\text{-}\acute{eu}\text{-}es$, $\hat{n}k\text{-}\acute{u}\text{-}\acute{om}$, $\hat{n}k\text{-}\acute{u}\text{-}bhis$. We could thus expect a $\hat{q}rh_2\text{-}\acute{eu}$ to mean "old age" just as $\hat{n}k\text{-}\acute{eu}$ means "death" while $\hat{q}erh_2\text{-}ou\text{-}s$ "old (woman)" fits neatly with $\hat{n}ek\text{-}ou\text{-}$ "dead (body)"

We have, then, two possible cases in which a Caland system includes, beside -i-, -ro-, and -ont- formations, an amphikinetic u-stem adjective. A third case, within the Caland system of telh₂- (ταλαί-φρων, τάλας/τάλαντ), which we know to have included a u-stem in any case, (OPr. talus

and, specifically in Latin, tolū-tim) would provide a satisfactory pre-form for tellūs. Specifically $\hat{g}erh_2-ou- \hat{g}rh_2-u- = nek-ou- \hat{n}k-u- = telh_2-ou- \hat{t}lh_2-u-$. The immediate outcome of such a paradigm in the IE dialect ancestral to Italic would have been tél-ou-s/tlā-u-és where the form of the nominative-accusative would secondarily imply an anit root tel-, an implication that would be supported by verbal forms such as the subjunctive tel-ā- (>tulam), the perfect te-tol-ai, and even the t_l- of the present tlnāti (or already tlneti?). Only tlā-to- would show tlā- but not, of course, alternating with tel- within a paradigm. The remodelling of a paradigm as anomalous as tel-ou-s/tlā-u-es would be all but inevitable and this remodelling could have been done at the early stage in question in one of three ways: Either by generalization of the tel- of the nominative-accusative throughout the paradigm or by the creation of a new "morphological" zero grade tal- to conform to the root shape of the nom. tel- or by the creation of a normal anit zero grade t_l- (still presumably possible at this early stage and supported by the t_l- of the nasal present). In fact it is this third development, the replacement of anomalous set tlā- by anit t_l-, which appears to have occurred. This is demonstrated by meditullium once the details of its formation are recognized. medi-tullium is a clear example of a series of compounds with second member in -iō- which function as locational adjectives. Thus with thematic second

member RV ádhi-gart-ya- "on the wagon seat": gárta- "wagon seat" or ὑπ-οὐράν-ιος "under the heavens": οὐρανός "the sky". But from non-thematic second members this compositional -iō- derivative is made on the oblique stem. RV tiráś-ahn-ya- "of the day before yesterday" (<"across, over a day"): áhar/áhn-(as) "day" or ἐπι-χθόν-ιος "upon the earth": χθών/χθον- "earth". For the type in Latin cf. further abs-tēm-ius. There can be no real doubt that medi-tullium contains just such a denominative -iō- derivative of the word for "earth" that eventually appears in Latin as tellūs/tellūris but which at the time of the formation of this -iō- compositional derivative still had a stem t(e)l-(e)u-; and more specifically the formation of e.g. tiráś-ahn-ya- indicates that medi-tull-ium is to be analyzed medhiō- (adjectival stem functioning as a virtual local adverb/preposition) plus -tlu-iō-, the oblique stem of the word for earth suffixed in -iō-. This medhiō-tlu-iō- develops to meditullium directly and regularly - originally in the meaning "in the middle of the earth" then "in the middle" and finally, with substantivization of the adjective, to "the middle". We may compare the analogous substantivization of ἐπιχθόνιος "upon the earth" to ἐπιχθόνιοι "mortals".

Meditullium, then, is an extremely precious form which shows that when this compound was formed, the oblique stem of the word for "earth" (in the paradigm which was replaced by the totally obscure-looking tellūs/tellūris) was something

that would develop directly to the -toll- of medi-tull-ium. And in view of the OPr. u-stem talus "floor" only a tl-u- is very likely.²⁷

We may therefore have some confidence in the reconstructed tel-ou-s/tl-u-es. The oblique stem is, in effect, directly attested in meditullium and the nom.-acc. tel-ou- is 1) required to motivate the anit tl- in the first place and 2) directly paralleled by nek-ou-, gerh₂-ou-. This paradigm was then of course inherited into Italic and with the paradigmatic levelling of root vocalism expectable at this stage was remodelled from tel-ou-s/tl-u-es to tel-ou-s/tel-u-es with generalization of the vocalism of the nominative. One may compare originally amphikinetic termo (cf. U. acc. termnom- < ter-m(ō)n-, Gk. τέρμων), sermo (probably primary and not deverbative to serere "concatenate" on semantic grounds), and even caro carnis (= U. karu/O. carneis) which, even though ultimately reflecting zero grade root vocalism, still shows the generalization of the vocalism of the nominative. For since the root is anit ker- (κείρω, Latin curtus < kr-to-) the vocalism kar- is probably to be explained as generalized from a "Lindeman's Law" kr̥r-ō(n), originally at home only in the nom. singular. In any case the fact is that tellus, which can hardly be anything but the re-arranged outcome of this paradigm, does show generalized e vocalism.

tel-ou-s/tel-u-es would have been a reasonably stable paradigm with levelled root vocalism but suffixal apophony at

the Italic stage. It is in both respects parallel to caro/carnis, and termō beside U. termnom shows that the Italic paradigm at least preserved -mō(n)/-mōn- apophony beside levelled root vocalism (if not indeed -mō(n)/-mōn-/ -mn- which is in no way excluded for Italic itself). But this stability would have been destroyed when, at some point during the Italic period -lū- assimilated to -ll- (Sommer Hdb² 220, Leumann L.Gr. 166). At this point the paradigm became telous/telles and with a more or less amorphous assimilation of the nominative to the oblique cases in tell- (which may well have included the acc. sg. by this time - cf. patrem, carnem) tellous/tell-es, tell-ei etc. But this still made for obvious difficulties with the result that the nominative tellous, virtually unanalyzable, was generalized as an invariant "stem" with zero desinence and thus the inflection tellous/tellous-es, tellous-ei, tellous-em > tellūs/tellūris.

h₂eich- "burn, shine", beside the primary verbal system which includes RV inddhé (h₂i-n-dh-), αἶθω, etc., makes a well-attested Caland system. Thus, with -i- in its "classical" function as adjectival first member of a compound Hom. αἰθί-οψ. Homer has an αἶθ-οψς as well which is to be compared to τάλα-φρων (Hom.) vs. τάλα-μένης (Hom.PN).

The -ro- correspondent is to be seen in ἰθαρός (Alcaeus, Hesychius) "pure, cheerful" (Chantraine Dict. Etym. 459, Frisk

GEW, 37) and perhaps AV vīdhra- "bright(ness)" < ui-h₂idh-ro- although the fact that this is a noun from a root with a verbal system makes the Skt. case ambiguous to some extent (cf. the remarks above on Ταλαρός).

OIr. áed, gen aeda, acc aed "fire" which seems to be neuter (cf. Vendryes Lex. étym. A-19) and is a u-stem (cf. further the Gaulish ethnic Aedui? - Vendryes l.c.) may reasonably be taken to be a substantivization of a u-stem adjective in the Caland system of h₂eidh-.

pleh₁ - "fill" (RV prnāti, paprāu, āprāh, Greek πίμπλημι πληρο, etc.) makes an unmistakable pair of Caland adjectives: -ro- in Latin plērus and the *πληρος presupposed by πληρώω reflecting pleh₁-ro- with a structure identical to that of δηρόν, Arm. erkar (dueh₂-ro-) and -u- in the widely attested adjective for "much, many": RV purú-, Av. pouru- reflecting plh₁-u-; OIr. il, Goth filu reflecting a pelh₁-u- which, in view of the pleh₁- of the verbal system, requires some explanation. Even on general principles we should expect the pair pelh₁-u-/plh₁-u-, without samprasāraṇa, to be less original than pleh₁-u-/plh₁-u- with it (and see Anttila IE Schwebeablaut, 147). And comparatives and superlatives like OIr. lía "more" < pleis < pleh₁-is²⁸, Latin plīsimā (Festus) < pleisamo- < pleh₁-is-, or Avestan frāiio < pleh₁-ios do show the expected root shape.

But pleh₁-u- itself is clearly attested in a hitherto

unexpected place. The relevant forms are Latin. The archaic Latin forms corresponding to classical plūs and plūrimus present a somewhat confused picture. We have, for the comparative, plous (S.C. de B. CIL I² 581) vs. pleores/pleoris (Carm. Arv. CIL I² 2) vs. ploera (Cicero Leg 3.6). But for the superlative ploirume (= plūrimī CIL I² 9) vs. plisima (Festus 222.8) vs. plusima (Varro LL 7.27) vs. plouruma (CIL I² 1861).

To begin with the superlative forms (although, as we shall see, they are of only indirect relevance to the argument), it is immediately apparent that plusima and plouruma are of no use for bringing some order into this confusion. plusima occurs in Varro among a set of examples of unrhotacized forms. But it is anachronistic even on the face of it since rhotacism certainly preceded the monophthongization of both -ou- and -oi-. Furthermore one of the "unrhotacized" forms cited by Varro in this group is ianitos for ianitor. plusima can be discarded as simply archaized from plūrima. Likewise plouruma (1st cent. B.C.) is clearly an archaized spelling for spoken plūrima: -ou- is already written -ū- in CIL I² 7 and 9 (Scipionum elogia) which cannot date from much after 200 even though they are later than the actual deaths of the men referred to (the consuls of 298 and 259 respectively).

This leaves ploirume and plisima as the only real evidence for the form of the Latin superlative. But they are mutually exclusive, reflecting plois- and pleis- and it stands

to reason that only one can be the inherited form. Given the choice between the two, plisima < pleisamo- has to be considered the original superlative. It is first of all supported by the comparative evidence of $\pi\lambda\epsilon\acute{\iota}\sigma\tau\omicron\varsigma$ (=Avestan fraēš^vtō) and, what is really more important, there is no model within Latin on which original ploi- could have been remade to plei- while the o vocalism of ploi- has an obvious secondary source - the o of plous, whatever its origin may be (so E-M 517). Therefore even if the assumption of an original plouis- for the original Latin superlative might seem, when taken by itself, to receive some support from the ON forms fleire "more", fleistr "most" (if indeed these are from plouis-²⁹), the inner-Latin situation with unmotivatable pleisamo- on the one hand and plous as a source of o vocalism on the other demand that pioisamo- be considered secondary.

In any case the form that is of central relevance here is that of the comparative plous. Beside plous are found pleores and ploera. pleores, if it is to be taken seriously at all, merely furnishes a pleos- < plēios- < pleh₁-ios- that matches the pleh₁-is- of pleisamo- > plisima. But, as E-M point out, it is not clear that it should be taken seriously for it would presuppose a rhotacized form in the Carmen Arvalium (vs, lases) and furthermore is only conjecturally taken as meaning plūrēs. Ploera (Cicero) on the other hand is clearly an archaization of classical plūra motivated by the attestation of such forms as plourume beside classical

plūrimī.

This brings us to plous itself. Attempted explanations of this form have taken two directions (Sommer Hdb² 455, Leymann L.Gr. 296, E-M 517, W-H 2.327), both involving complicated corollary assumptions. On the one hand plous has been taken as reflecting plō-is > plōis > plūs. This involves the further unspoken assumption that from an original plōh₁-ios/plōh₁-is > plōios/plōis, ō vocalism was generalized to the -is- form and that the resultant plōis was treated differently from an original plōis, since plous in the SC de B, where ou and oi are correctly written, simply cannot reflect an original plōis. Furthermore, plisima, as we have seen, argues against plōis in the first place.

Somewhat better is the assumption (see Sommer 455) that pleh₁-ios > plēios > plēos and this became Latin plēös which was remodelled to pleüs on the model of minus and then developed to plēus > plous. This will not work in this form at all since placing the remodelling of plēös to pleüs after the pre-vocalic shortening of long vowels in Latin is almost surely too late. Better would be plēios > plēös and then the remodelling to plēüs > pleüs > plēus > plous. But this is also unlikely because there is no reason whatever to assume that an -eu- diphthong which arises secondarily only within Latin would become -ou-. In fact -eu- that arises secondarily in Latin (leuis, breuis) shows that we might well expect the reverse - i.e. the retention of a new -eu-. And of course

this would rule out the first chronology as well.

The only way of saving this approach would therefore seem to be to assume that plēōs was remodelled after minus to plēūs and then became plēūs already in Italic before the change of -eu- to -ou-. This in turn presumes that minus is a form of great antiquity despite the fact that it gives the impression of being the replacement of a -mīs (in ni-mīs < ne-mīs) < mih₂-i-s formed, like sat-i-s, from an i-stem adjective plus adverbial -s: mih₂-i: meih₂-u- (Myc me-u-jo) = sat-i: sat-u-(ro)-. Furthermore, minus as an Italic form of such great age is not well supported by the at least apparent divergence between minuo (with which minus must be closely associated) and Oscan menvum (see Buck O-U Gramm. but also E-M 405).

Finally, does minus itself have an original -u- at all? The natural assumption, in view of minuere, μινύ-ωπος "short-lived", Corn. minow, etc. is that it does. But there is the following consideration. If minus has an original -us, then minor is back formed to minus on the model maior: maius etc. But this model can have come into play only after -os# > -us# in the late 3rd century (first example tempestatebus CIL I² 9 dated to the last quarter of the 3rd century and possibly as late as 200 - see Degraffi 1.181). The problem is that if -os > -us was taking place only in the latter half (and quite possibly only the last quarter) of the third century - i.e. around or only very slightly

before the time of Plautus (first play already produced in 200), it is surprising to find minor, which depends upon the completion of this change, already well attested in Plautus. The chronology is too close for comfort. And if minus has original -os, then explaining plous as having -us from minus becomes impossible, of course.

All these difficulties can be avoided by assuming that behind plous lies a u-stem adjective not pelh₁-u- but pleh₁-u-. Perhaps as early as late IE this stem would have become hiatic pleu- (e.g. nom. pleh₁-u-s > pleu-s) and pleu- soon thereafter. From this stem pleu-, and not from the root, was derived, at a post-IE date, a comparative adverb in -is with exactly the same formant as in mag-is. For the derivation of the comparative from the u-stem positive rather than the root cf. Myc. me-u-jo (as if from meih₂-u-^uiios to put it anachronistically - probably actually from me(ⁱ)u- (< meih₂-u-) plus the comparative suffix).

This pleh₁-u- > pleu + is > pleuis is exactly comparable for the structure and chronology of development, as we shall see, to grāuis which represents g^ureh₂-u- (Latin full grade root corresponding as usual in this type to the zero of βapύς, ourú-) which > grāu- and, with the later addition of -i-, again regular for Latin, > grauⁱ-. This pleuis > Italic plouis and this develops absolutely regularly to plous (the form found in the S. C. de B.), whence plūs. For -ou- as the immediate outcome of the "contracted" sequence -ou^u- cf., in

the S.C. de B. itself, noundinum (<nouen-> later nūndinum/-ae and coniourase in which the -iour- represents earlier ioues- (cf. ioues-at, ioues-tod) and likewise becomes classical iūr- (iūr-is, iūr-āre).

This plouis < pleuis, at any point after the Italic change of -eu- to -ou-, was free to influence the vocalism of original pleisamo- to plouis-. Hence plourume beside archaic plisima. The positive pleu-s "much" was of course replaced in Italic by the ancestors of Latin multus, Oscan molto, Umb. muta after having served as the derivational base of the comparative adverb pleuis. Thus Latin furnishes evidence of the expected pleh₁-u- beside problematical pelh₁-u- in Irish and Germanic.

Greek πολύς apparently not only has schwebeablaut problems but o vocalism as well which, within this Caland system, is reminiscent of that of OPr talus vs. the presumably original e/zero apophony of the paradigm that ultimately is responsible for Latin tellus vs. (medi)-tullium and, less directly (since it is a matter of i-stems but still, doubtless, Caland adjectives) the o grade of πολύς is reminiscent of e.g. OIr. doë (duoh₂-i+o-) vs. (perhaps) Greek δαον (if <dueh₂-i+o->). We may notice in passing that, as already mentioned, Caland h₁rudh-ro-/h₁rudh-i- "red" has a thematic h₁roudh-o- beside it, with o vocalism. It is interesting to note that Caland πολύς (-u- beside the -ro- of plērus) is supplanted in Greek itself by thematic πολλο- with, of course,

o vocalism. Only the obscure -λλ- of the thematic forms disturbs the otherwise perfect parallelism between hrudh-ro-/hrudh-i-:hroudh-o- and pleh₁-ro-/pl(e)h₁-u- and pelh₁-u-:polh₁-o-. But short of assuming a syncopated πολλο- (Schwyzer Gr. Gramm. 265, 584 with literature) which not even Szemerényi (Syncope 289) seems prepared to accept,³⁰ the -λλ- of πολλο- would seem to have to result from a gemination of obscure motivation since even the assumption of -li-, the only cluster that will give -λλ- in all dialects, is difficult for this set root. polh₁-iio- would > *πολιο-. A few more examples of this o thematic vs. e/zero Caland pattern will be introduced below. Likewise it will be seen below that the schwebeablaut of pelh₁-u- may have something to do with the question of the original inflection of this type of u-stem adjective.

tek^(u) - "run" (RV tákti, OIr. teichid, etc.) furnishes a final example of a non-adjectival root with a Caland system. Beside the u-stem of RV táku- "quick, speedy", Avestan has Caland -i- in the compound tači-āp- "(with) running water" and there is furthermore evidence from derivatives for an Iranian *taxra- as well (see Gershevitch, Gramm. of Manichean Soodian, 193).

b. The central members of the Caland system not forming adjectives.

1. -es-, making neuter substantives, alternates in a significant number of cases with -i-, -ro-, -u-, -ont- adjectives:

kreuh₂-s in kráviḥ, κρέας beside krū-ra-, ṡruui-(dru-), cruent-us, etc. Latin cruor (along with O. krus-tatar - ultimately a denominate verb from the adj. krūs-to-) also surely belongs here, cruor vs. cruentus has been interpreted (see e.g. E-M s.v.) as pointing to an r/n stem (as if *kruu- or kruu-en-(to)-). But there is not the slightest evidence of an r/n stem elsewhere from this root while *kreuh₂-os > kreuos (with later transfer to the animate type in original -os, which is usual in Latin especially for Caland -es- stems) is paralleled in Greek and Skt. and the analysis kruh₂-nt-o- is supported by Avestan ṡruu-ant-.

teḷḡ-es- in RV téjas vs. Av. tiyra-, tiži, OIr. tiug (tiq-u-) as above.

teuh-es- (root of távīti "is strong") could well be reflected in RV tavás- "strong" beside Caland -i- in compounds like tuví-śravas- (tuh-i-). But in this case (and in principle in all cases in which a given root supplies both a primary verb and a Caland system) the derivational history of the -es- stem is ambiguous since -es- stems are often deverbative (type ján-as-, γένος to a root without a Caland system at all).

h₂erā-es- beside what is perhaps the most famous Caland system of them all - that of argh- (κέραυρος etc.), ṛjra-, argent-om etc.-is attested in the -no- derivative of Greek ἀργεννός < *arges-

kuδos beside kuδρός kuδ-άνειρα ultimately reflects the pattern although there is every reason to think that this particular item, to judge by its vocalism, was created beside kuδ-ro- and kuδ-l- at a relatively late date. The only point to be made here is that the models on which the kuδ-ro-/kuδ-l- Caland system was in fact filled out with an -es- member were other Caland systems which already included an -es- stem.

bherāh-es- is assured beside the -ont- (adjectival) of barāzant- etc., the -ōnt (collective/abstract) of Toch A -pārkānt B -pirko, the -u- of Hitt. parku-, Arm. barj(r), and the -ro- of Toch. A pārkār B parkre not only by Av. barāzah- but also by as isolated a case as Arm. erkna-berj "with the height of heaven". The second member of the compound goes back to -bherāh-ēs- and can be directly compared to RV (dvi)-pārhas (Meillet MSL 23, 328).

dhers-es- beside the Caland adjectives dhers-u- (θρασύς/θαρσύς), dhers-i- (Av. daršī-dru-, Greek θερσότης < dhersi-i-tā- "bold goer", a formation comparable to RV dabhīti- < dabhi-i-ti "of mean/(be)littl(ing) course, behavior") and dhers-ont- (RV dhers-a(n)t- with no root present

or aorist beside it) Greek supplies the -es- stem $\theta\acute{\epsilon}\rho\omicron\sigma$.

$h_2\text{euq-es-}$ reflected in RV $\acute{o}jas$ Av. $ao\check{y}\bar{o}$ beside RV $uqr\acute{a}$ - Goth. $uqr\bar{o}$, Av. $ao\check{y}i\text{-ia}\bar{h}$ -, OPr $a\bar{u}qus$ as above.

$h_1\text{reudh-es-}$ $\acute{\epsilon}\rho\epsilon\nu\theta\omicron\sigma$, Latin (dialectal) $r\bar{o}bus$ in the Caland system of RV $rudhi\text{-kr}\bar{a}$ -, $\acute{\epsilon}\rho\nu\theta\rho\acute{o}\varsigma$ etc.

dens-es- is guaranteed at least for Indo-Iranian by RV $d\acute{a}msas$ - Av $da\eta hah$ - for the Caland system that also includes RV $das\text{-r}\bar{a}$ - Av $da\eta r\bar{o}$ and Greek $\delta\alpha\acute{\iota}\text{-}\phi\rho\omega\nu$. $\delta\acute{\eta}\nu\epsilon\alpha$ "schemes, plans" belongs here too if $\delta\acute{\epsilon}\nu\omicron\text{-}\epsilon\sigma$ - may be assumed to be remodelled to $\delta\alpha\nu\omicron\text{-}\epsilon\sigma$ with the a -vocalism of $\delta\alpha(6)\text{-}\acute{\iota}\text{-}\phi\rho\omega\nu$ (and $\delta\alpha\eta\nu\alpha\iota$, $\delta\iota\delta\acute{\alpha}\delta\kappa\omega$) See Frisk with references to Brugmann *Grdr*² 2.1.518 but also Wackernagel *KZ* 29, 137 who proposes connection with $\delta\acute{\eta}\omega$. See also Chantraine *Dict. \acute{e}tym.* who seems to favor the traditional connection. The clear Caland pattern exhibited by this root in Greek ($\delta\alpha\text{-}\iota\text{-}$, $\delta\alpha\text{-}\eta\text{-}$ see below) should itself be some argument in favor of the equation. $\delta\acute{\eta}\nu\epsilon\alpha$: $d\acute{a}msas$ -, $da\eta hah$ - and $\text{πολυ-}\delta\acute{\eta}\nu\epsilon\alpha$ (πολύβουλον , πολύμητιν -Hesych) beside RV $\text{puru-}\underline{d\acute{a}msas}$ - is suggestive.

kret-es- To the Greek Caland system already listed above (κρατύς , κρατερός / καρτερός ³¹, $\text{κρατι-}\delta\theta\acute{\epsilon}\nu\eta\varsigma$) clearly belongs κρέτος .

mak-es- is the -es- stem belong with μακρός *macer*, Av. masi-ia . On the one hand Greek $\mu\acute{\eta}\kappa\omicron\varsigma$ / $\mu\hat{a}\kappa\omicron\varsigma$ and on the other

Av masah- point to māk-es- beside māk-es- which shows that we are dealing with a lengthened grade māk- in the Greek forms rather than a *meh₂k- or the like. Such lengthened grade s-stems³² may point to an akrostatic s-stem type beside the more common proterokinetic type³³ exemplified by κρέας, κράνιη (kréuh₂-s). If so, we have both types participating in the Caland system.

αἶθος "heat", AV édhas- "fuel" furnishes a good example of a pair of forms that should not, despite the apparent exact formal agreement and well-developed Caland system of this root, be considered Caland -es- stems. αἶθος is a relatively late form obviously deverbative to αἶθω. édhas too is post-RV and the assumption that it too is deverbative (to inddhé "ignites") neatly explains the semantic divergence between it and αἶθος. If there is a real Caland -es- stem here at all it is perhaps to be seen in the aidh-s- of forms like L. aestas, aestus where we are on somewhat safer ground because of the lack of a verb from h₂eidh- beside them.

h₂enôh-es-: Beside the u-stems of, e.g., OIr. cumung (kom-anqu- < h₂enôh-u- vs. inge "tightness" < enqiā < h₂nôh-), amhú- "narrow(ness)", Goth. agwus (anqu-xanqu-) and the possible -i- of anqi-portus (although the case is basically ambiguous and anqu-portus is just as likely), legitimate Caland -es- forms can be seen in RV ámhas-, Av. azah- (with no real verbs beside them - RV áhati/anāha (?) totally unclear

✓ and áhati may not exist - see Mayrhofer 1.68. The Avestan forms listed under az- by Bartholomae niiāzata, niiāzayən, even if they are to be segmented nii-āz- show an āz- not easily reconcilable with h₂enġh-/h₂nġh-). Latin angor, compared directly to these I-Ir. -es- stems (Pokorny IEW, 42, W-D AiGr 2.2.319, etc.) is instead a relatively late deverbative formed to anco. Cf. tremor: tremo. An older ancoos can be safely concluded from anxius and angustus, but this may easily be ultimately deverbative itself.

h₂eus-ōs The word for "dawn" (ἠώς, aurōr(a), uśāh, uśā), an animate/collective s-stem with an original amphikinetic paradigm h₂éus-ōs/h₂us-s-és also belongs, as an s-stem, to a Caland system and thus illustrates a third s-stem inflectional type that may belong. The -ro- adjective corresponding is reflected by RV usrā- "shining, of the morning". In this case, of course, the -ro- adjective has an r-stem noun beside it (RV voc, usar, gen usr-ás). But it is by no means clear that cases in which this is so (and there are a number of them) are ultimately to be kept distinct from those in which no r-stem figures in the picture.

Beside the s- and -ro- stems here the -i- stem is possibly supplied by ἠι-καυός "dawn-singing" with first member < h₂us-i- > ausi- > ā(u)i- and probably identical to Av uśi- in, e.g., uśi.dam- (name of a mountain - "house of the dawn"?³⁴). These forms have been interpreted as locatives

with desinence -i, which is perfectly possible as long as one assumes that the original locative of h₂eus-ōs, which would have been h₂us-és-(i), was remade in IE itself to h₂us-i in conformity with the oblique cases in h₂us- (<h₂us-s- by the same -ss- simplification that produced *esi - Gr. ἐς, RV ási - from *es-si) and preserved in this compound while the ausōs paradigm itself had the -ōs- vocalism of the nom-acc. generalized in Greek. In short, nothing certain here.

ǵerh₂-s-/ǵerh₂-s- is indicated within Greek itself which has both γῆρας "old age" and γέρας "privilege". That this meaning is a development of "privilege of old age", however, is indicated by, e.g., Δ323 τὸ γὰρ γέρας ἐστὶ γερόντων (see Chantraine Dict. étym 216) and the derivative γεραίος simply means "old". This s- stem is also found in RV jarás- f. "age, fragility"^{which} belongs to a very small group of -as- stems which are animate but non-adjectival (W-D 2.2.222ff.). Interestingly enough, jarás-, like the other two clearest members of that group usás- (as above), bhiyás- (see below) furnishes an s- stem to a Caland system. Greek γῆρας/γέρας on the other hand is neuter and is an example of the μηκος (possibly originally akrostatic) type so that jarás- and γῆρας/γέρας may represent two different inflectional types within one Caland system - more on these forms below.

pāḡ-es-: RV pājas, which seems to mean "surface, face" (see Mayrhofer with reference to Bailey ESOAS 12, 326 and 13,136),

cf, pājasī "heaven and earth" (<"the two surfaces" Bailey 1.c.) is matched by reflexes of Iranian *pāzah- (Mayrhofer 1.c.). This s-stem, in turn, may be the Caland -es- beside the ultimate -ro- of the Toch A adverb pākār "openly". Toch B pākri seems to reflect a slightly different (derivative) formation, but A and B diverge in adverbial formations quite often (see Krause-Thomas 1.170).

temh-es- beside YV tāmra-, OIr. teim (temh-i-) is continued by RV tāmas- "darkness", Av tamah-, Latin adv. temere "blindly" > "thoughtlessly" (see e.g. E-M 679).

tep-es- furnishes the fully expectable -es- stem to the Caland system of RV tāp-u- "hot", OIr. té = RV tapant-, ORuss teplŭ. It is reflected in RV tāpas and (ultimately, with the usual Latin replacement of the -(ŏ)s type by the -ōs type) Latin tepor.

Another Caland system limited to Greek is that of $\psi\epsilon\upsilon\delta\iota\varsigma, -\iota\omicron\varsigma$ "false" (Pindar) vs. $\psi\upsilon\delta\rho\acute{o}\varsigma$ "lying, untrue" beside $\psi\epsilon\upsilon\delta\omicron\varsigma$ "lie, falsehood".

These examples should suffice to illustrate the pattern. Others will be introduced below in other connections.

2. There is a second central member of the Caland system which does not form adjectives. It is, as Watkins pointed out (TPS 1971), the stative suffix -ē- (-eh₁-?) which, in a

fashion which is absolutely characteristic of the Caland system as a whole, "derives" from Caland adjectives stative verbs meaning to be what the underlying adjective denotes but replaces, in the first instance, the adjectival suffix. The stative suffix occurs both in unextended form ($-\bar{e}-$) and extended by "inchoative" $-\hat{s}ko-/-s-$ ($-\bar{e}-\hat{s}ko-/-\bar{e}-s-$; Watkins l.c. for details). Watkins adduces clear examples of the type:

$\acute{\alpha}k\rho\acute{o}s$, acus (orig. "sharp" - cf. acuere "sharpen"); acēre "be sharp"

RV rudh-i-, $\acute{\epsilon}\rho\upsilon\theta\rho\acute{o}s$: rub-ēre, OIr. ruidi etc.

L. macer (cf. also Hitt. makla-nt-) : macēre (Plaut)

L. piger "unwilling, lazy": pigēre "be reluctant"

Hitt. nakki- "heavy": nakk-e-/nakk-eṣ- "be(come) important"

palhi- "broad" (cf. also perhaps OIr. lár): palh-eṣ- "become broad"

park-u- (brh-ant-, pärk-är): park-eṣ- "become tall"

A number of other examples are introduced as well. Typologically later, in that the $-\bar{e}-$ is added to the adjectival suffix rather than (synchronically) replacing it is the type exemplified by tepu- (dabhra'-, dabhīti-): tebau-eṣ- "become small"

Further examples can be added:

To the Caland system of h₂euq- (ugrá-, aojī-iah-, OPr aūgus as above) belongs the $-\bar{e}-\hat{s}ko-$ of Latin augēscere (Naevius) "become great(er)". This verb is to be carefully

distinguished from augēre, which is functionally a causative and a causative only (although the handbooks - e.g. E-M s.v. augēre - are unclear on this) and moreover makes auctus.

Beside das-ra-, δαῖ-ρρωv, Av. dayhah-, the Homeric "aorist" δα-ῆ-ρα likewise supplies what is ultimately an -ē- of the Caland system ("is wise" > "did learn").

The possibility of ambiguities here is illustrated by a case like L. candēre. On the one hand it seems attractive to assume a -ro-: -ē- Caland relationship between it and RV candrá- "bright" (also perhaps κάνδαρος·ἀνθραξ Hesych?). But kand- also has a verbal system (ac-cendere) so that candēre may represent merely a characterized present (intransitive) in -ē- within the verbal system. Still we may slightly prefer the Caland -ē- interpretation here since the more usual pattern for intransitive: transitive characterized presents in Latin is that of iacēre: iacio, pauēre: pauio, habēre (originally intransitive): OU habio-. So also augē-scere above.

To the Caland root tep- "hot" (RV tápu-, ORuss teplŭ, RV tapant-, tápas, etc.) a clear example of -ē- as a Caland formant is furnished by Latin tepēre.

Latin tumēre "swell" (ex-tumēre Plaut.) beside RV túmra- "mighty" fits the pattern as well.

A case like stupēre: stuprum is illustrative. It looks

attractive at first, but is misleading. stupere "be struck" and thus "dazed, benumbed" clearly belongs (as representing (s)tup-ē-) beside the tup-io- of Greek τύπτω Cf. iacere, iacio and pauere:pauio. stuprum then becomes a problem since, as a -ro- adjective, it would be isolated among the (basically verbal) derivatives of (s)teup- and in any case this would cause semantic difficulties ("struck" > "disgrace"?)

An archaic instance of stuprum is of some help, however. Naevius uses the word in the Bell. Pun. 42:

seseque...perire mauolunt ibidem, quam cum stupro
redire ad suos popularis

In this passage stuprum may be interpreted as a verbal noun in -ro- < steup- "strike, beat" with a meaning very close to its etymological one - thus "a knockdown, defeat, setback" and the passage would read "They prefer to perish on the spot rather than return to their countrymen in defeat" (and therefore "in disgrace"). The semantics would then simply be "defeat" > "disgrace" and stuprum would then be not a -ro- adjective (implying a Caland system) but rather a deverbative of the type (not common in Latin) τάφρος "ditch": θάπτω "dig" and δῶρον: δίδωμι for that matter, a formation having nothing to do with the Caland system.

In any case, what is essential for our purposes is that a denominative stative within the Caland system (acere, macere, aucescere, tumere, etc.) be distinguished from -ē- used as a formant furnishing characterized presents within the verbal

in -es- are, as already noted, extremely rare and in the few cases where it seems admissible because the thematic adjective is well-attested, the thematic adjective has o- vocalism while the Caland system beside it has e or e/zero. At best one is entitled to speak of an -o-: -ē- "system" ultimately independent of the larger Caland system which shares -ē- with it just as, e.g., -ont- is shared by the Caland system (where it functions as a primary adjective formant) and the verbal system (where it functions as a verbal adjective formant). On the other hand the solution may be much simpler. If one assumes that within the Caland system -ē- replaces the suffix of the formation serving as the derivational base (rudh-ro-: rudh-ē-) but outside it is added, in the normal fashion, to the stem (so flōs: flōr-ēre, sen-: sen-ēsco, then one might wish to assume that, e.g., OHG altēn reflects not h₂el-t-ē- but ultimately h₂el-te-ē- (or h₂el-te-(e)h₁-). It does not matter here which of these views of the relation of thematic formations to the Caland system (with which -ē- is shared) one wishes to adopt. It matters only that some distinction be made between the albēre, altēn type and the ἄκρως, acus: acēre Caland type.

3. The marginal members of the Caland system

It was noted above that the Caland system seems to have a set of members less central to the system (in a sense as yet undefined) than are -ro-, -i-, -u-, -ont-, -es- and -ē-.

For now these formants will be considered marginal only in the sense that they are less frequent than those already exemplified. A further distributional criterion for setting them apart in this way will be developed below.

-mo-. This suffix was noted by Caland already in his original KZ 31 article as one which is replaced by -i- in compounds. As it turns out, the number of examples in which this is the case - or, from our viewpoint, in which -mo- alternates with one or more of the Caland suffixes above - is relatively small. There are, however, a number of excellent cases:

Av. Xrū-ma- "grisly": krū-rá-, cru-ent(us), Xruui-dru-, kréas

RV tiq-má- "sharp": tiyra-, tiug, tiži-, téjas

RV sidh-má- "(going) straight on": sidh-rá- "id."

Latin līmus "askew, sidelong", an adjective used almost exclusively with oculus or ocellus "eye". Cf. Plaut. limis oculis aspicere, Terence limis aspicere, Ov. Am 3.1.33 limis subrisit ocellis. This form not only provides an example of Caland -mo- but completely clarifies the structure of līguis (hapax Frontinus) and (ob)līguus. These forms represent a bahuvrihi lih₂-i-h₃k^u-o- "with the face sidelong, turned". The structure of the compound is exactly parallel, down to the zero grade of the second member, to the bahuvrihi bīmus

(dui-ôhim-o-) "Having two winters (of age)". For the alternation of -i- and -o- as composition vowel on the second member of a bahuvrihi which is neither thematic nor an i-stem cf. Plaut. indecorus vs. Acc. indecoris (and see Bader Composés nominaux 168ff.)

The root of this lih₂-i-· lih₂-mo- Caland system is probably to be referred to that of λίνακαλ·τρέπομα (Hesych.) which clearly has nothing to do with the group of words meaning "soft, tender, gentle" with which Pokorny IEW 661 puts it. Presumably the same Caland -i- stem adjective lih₂-i- (a root, as opposed to a root noun, as first member in any kind of a compound is not a justifiable assumption) also occurs in lī-mes < *lih₂-i-mi-t-s with second member -t- stem agent type to the root of meāre (root *mei-) meaning originally "going in a turning fashion, turning(ly)" thus "road running along a boundary". (see E-M s.v. līmes). It is worth noting that these compounds, if interpreted in this way, furnish the only really sure examples of Caland -i- in composition in Latin which is relatively well supplied with -i- stem adjectives otherwise.

A possible example of -mo- beside -ro- may be provided by the various words for "son-in-law", if one may assume that Latin gener is ultimately the reflex of a gemh₂-ro- > gemaro- remade to genaro- under the influence of gens, gnatus, etc. and hence gener. The rare (but partly archaic) athematic

✓ forms of the type generibus (Accius-see also TLL 1770.24ff) would then be modelled on the other names for relations, as is not unlikely (cf. jāmātar-, as below). Greek γαμβρός likewise ultimately would reflect a gmh₂-ro- with root vocalism remodelled on γαμέω. RV jārá- "suitor, lover" is usually compared as well and it too then reflects *gmh₂-ro-. But there are certain difficulties with the connection (see Mayrhofer s.v.)

Beside this gemh₂-ro-/gmh₂-ro- one may see a gmh₂-mo- > IIr. já-ma, which can be concluded from Av. zāmaoiia- "brother of the son-in-law" < zāma-u-ia- (for the suffix cf. pitr_o-y-va- "father's brother"), as is standardly proposed. This jāma- itself, on the other hand, was remade to jāmātar-/zāmātar- on the general model of the names of relations in -tar- and specifically (for the -māt-) mātar- (see Mayrhofer s.v. W-D 2.2.693f. - the assumption of jāmā-(tar) from an original stem jāmar- with nom. jāmā seems strongly disrecommended by zāmaoiia- itself.³⁵

The general picture, then, is one of independent assimilations of gemh₂-ro-/gmh₂-ro- and gmh₂-mo- to the morphology of the nouns of relationship and closely related items (so gener, zāmaoiia-, jāmātar-/zāmātar-) which is not inconsistent with a view that the items involved were originally simply adjectives "lover, beloved". In short, nothing decisive.

grh₂-mo- within the large Caland system of jarant-,

γεραρός, γήρας / γέρας, γρᾶς etc. is reflected by Avestan a-zarā-ma- "not decreasing, not weakening."

RV dasmá- beside dasrá-, δαί-φρων, danhah-

Gk. παλάμη, L. palma (< palamā) "palm" (< "flat" cf. "the flat of the hand?") beside Hitt. palhi- and reflecting plh₂-mo- are examples on the same level as the Celtic words for "surface" OIr. lár, W. llawr (pleh₂-ro-/plh₂-ro-). They are good examples of the pattern if one may assume that they are substantivized adjectives.

A few other examples of -mo- as a Caland suffix will be introduced below in other connections.

The examples of Caland -no- are even fewer than those of -mo-. Such cases as plh₁-no- (purná-, OCS plŭnŭ, Goth fulls, OIr. lár - Latin plēnus is perhaps remodelled on plēre, as perhaps Av pərəna- on pərənā- so Meillet BSL 27 c-r.) cannot be used for the purpose with complete confidence since, even though the root has a Caland system (plh₁-u-, pleh₁-ro-) -no- formed IE deverbative adjectives to verbs which have no Caland system. The same applies all the more to a form like jurná- "decayed" (to jarati) which is less well supported as a -no- adjective by comparative evidence than purná-.

This means that very few examples will be usable. Some possible ones:

pleh₂- "broad" (palhi-, etc.), an adjectival root, has in

its Caland system L. plānus "flat" which corresponds further to Latv. plāns "flat, even", which is probably not to be separated from Lith. plónas even though the latter means "thin". One may wish further to add a -u- stem to this Caland system by interpreting Latin plautus "flat, broad" as pleh₂-u-(to-).

pleth₂- also "broad". These two "roots" may ultimately reflect pl-eh₂- vs. pl-et-h₂- (see Anttila Schwebeablaut 148) and the fact that both have Caland systems including the rare -no- may be taken as some support for assuming this.

At any rate the Caland system here is constituted by RV prthú- "broad", Av. pərəθu-, Gr. πλατύς beside the -es- stem of práthas "extension", Av. praθah-.

To this we may add OIr. lethan "broad, wide", W. llydan, Gaulish Litano- < plth₂-no-

Hom. πυκνός beside πυκι-μήδης. The coexistence of πυκνός and πυκινός in Homer with the apparent disappearance of πυκινός thereafter does not, we shall see, warrant the conclusion of Szemerényi Syncope 82-3 that πυκνός is simply syncopated from πυκινός.

sueid- "shining"

Lithuanian provides the -u-stem adjective svidus as well as the corresponding -ē- stative svidėti, svidėjau.

The corresponding -es- stem is probably to be seen in Latin sīdus "constellation" (sueid-es-). To this Caland system

belongs the -no- adjective Av. $\chi^u aēna-$ (sueid-no-) "shining"

The tep-ne- found further extended in OIr. tened (tepne-t-) and Av. tafnah- (tep-ne-s-) may also furnish an example of -no- as a Caland suffix beside tápas, tápu-, té, teplū, tepēre etc. In such a clear Caland root this is probably better than assuming an -n- stem derivative. One also hesitates to assume a deverbative noun where the verbal system is confined to I-Ir. Even here, Avestan has only presents.

$\kappa\upsilon\delta\nu\acute{o}\varsigma$ (Hesiod) beside $\kappa\upsilon\delta\rho\acute{o}\varsigma$, $\kappa\upsilon\delta\epsilon-\acute{\alpha}\nu\epsilon\lambda\pi\alpha$

A few other possible examples could be introduced, but there are not many. It will be clear that, as far as sheer number of formations is concerned -no- certainly deserves to be considered marginal as such to the Caland system. The importance of -no- within the whole picture belongs to a different level as we shall see.

4. Suffixal interactions within the Caland system and the formation of complex suffixes.

So far the point of view we have been taking here - that the Caland system is to be viewed as a system of parallel formations involving a closed set of formants - has been a distributional one. The major point to be made has been only that it cannot be an accident that there are, as argued at the outset, a large number of roots making derivatives in -ro- beside -i- beside -u- (always taking Bloomfield's

restriction into consideration) beside -ont- and that these in turn occur beside nouns in -es- and verbs in -ē- with significant regularity while, on the one hand, -to-, -io-, -uo-, -o- are excluded from the system and, on the other hand, comparably clear and widespread derivational systems (for example -men- nouns directly beside -ti- nouns, as above) do not seem to exist.

At this point, however, we will turn our attention to the internal dynamics of the system itself and the major factor to be noticed here is the mutual predictability between the members. So, for example, there can be little doubt that Indo European had an adjective suād-u- "sweet" and in some sense this was the word for this. Yet in Tocharian and Tocharian alone, we find the -ro- stem A swār B swāre (<suād-ro-) A parallel example is that of ōk-u- "swift" (whatever the original structure of the root) which gives the impression of being the word for "swift". But we find a -ro- formation, again isolated in one language: the ōk-ro- of jastrebi etc. These situations, it seems, are to be explained by the mutual implication which must have existed between the members of the Caland system. Even on a later chronological plane we see similar phenomena. So, e.g., the creation in Greek of a βάρος "heaviness" to βαρύς "heavy" which ultimately may be considered within the present context to be a filling out of the Caland system since βάρος was made to βαρύς on the model of pre-existing -u-: -es- pairs inherited as such

within the Caland system. Similarly the productive set of the type tepor: tepēre can reasonably be interpreted as taking as its starting point inherited -es- stems beside -ē- verbs.

For the same reason h₁rudh-i- and h₁rudh-ro-, a typical Caland pair, likewise with mutual implication and predictability could very well owe to this special relationship the fact that they were contaminated in Indic - thus rudhirá- (W-D AiGr 2.2.361). Nor is this an isolated phenomenon. Examples of both a precisely parallel and of an analogous sort are numerous:

Av. ǰaiǰi-vafra "with deep snow" Skt. gabhi-sak "deep below" with -i-, Av. ǰafra- "deep" with -ro- but Skt. gabhīrá- "deep". The long ī is problematical (see W-D 2.2.461, Frisk Zur Indoiran. und Griech. Nominalbildung 30, 41) but no more so than, e.g., bravīti vs. anīti.

Within the Caland system of ǰerh₂- (ǰarant-, γραῦς, γέπαρος, OHG karl < ǰorh₂-lo- vs. OE ceorl < ǰerh₂-lo-) it is reasonable to explain Runic karilR in the same way whether this represents an actual -i- stem (and cf. Av. zairi-(na)-) "contaminated" with -lo- or an -i- stem extended by -lo- or merely as showing a complex suffix -ilo- formed in one of these two ways within the Caland system extended to this word which also has a Caland system and merely replacing simple -lo-. Similarly beside the u-stem adjective ǰ^urh₂-u-

(root $q^u r e h_2$ - cf. Toch. B $k r \bar{a} m \bar{a} r$ "load"), we have a "classical" Caland $-i-$ in composition for $\beta \rho \iota - \eta' \pi \nu \sigma$ "loud-shouting". $q^u r h_2 - i - > q^u r i h_2 -$ by the laryngeal metathesis of $-H i -$ and $-H u -$ to $-i H -$, $-u H -$ ³⁶ that accounts for e.g. $\pi \hat{\nu} \rho$ ($< p u h_2 - r -$ vs. original stem $p e h_2 - u e r -$) or $\pi \acute{\iota} \nu \omega$ ($< p i h_3 - < p h_3 - i -$; root $p e h_3 -$ with enlargement $-i -$). But there is also $\beta \rho \iota \alpha \rho \acute{o} \varsigma$ ($q^u r i h_2 - r o - < q^u r i h_2 - i - r o -$ with the same metathesis. Again this is a matter of complex suffix formation within the Caland system motivated by the mutual implication of $-i -$ and $-r o -$. The question (perhaps in principle unanswerable) of whether in this or that specific case we are to think of an $-i -$ contaminated with the $-r o -$ which it automatically implies or extended by such a $-r o -$ can be left aside. In either case the motivating circumstance is the special relationship between these formants.

Parallel is the case of Caland roots with complex formations in $-u - r o -$. Here again in the matter of complex Caland suffixes there is nothing unique about $-i -$. In principle $\acute{\alpha} \rho \gamma \upsilon \rho \sigma$ "silver" beside the $-u -$ of L. $a r g u - e r e$ and the $-r o -$ of $r i r \acute{a} -$ $* \acute{\alpha} \rho \gamma \rho \acute{o} \varsigma$ is exactly analogous to $r u d h i r a -$ beside $r u d h i - k r \bar{a} -$ and $r u b e r$ and is again a matter of the close association of $-u -$ and $-r o -$ within the Caland system.

A complex $-u - r o - / -u - l o -$ once formed under these conditions may then easily spread to other Caland adjectives. Thus, e.g.,

RV amhurá- beside amhú- or bahulá- beside bahú- (= παχύς and cf. Av. bazah-) or, again, beside gerh₂-u- (γρᾶς) and yérapos (ġerh₂-ro-) cf. Av. zaurura- (ôrh₂-u-ro- or ġerh₂-u-ro-). Another comparable formation will be, e.g., Latin satur "sated" beside the -i- stem of the adverb sat-i-s.

If one possible complex suffix formed under the motivation of the close association of -i- and -ro- within the Caland system is -i-ro-, the other logical possibility, that is -ri-, also exists.

Beside Av. tiyra- and tiži- (sruua-) we are not surprised to find tiyri- "sharp" (> "arrow"). Nor is ākri- (beside āk-ro-, āk-u-, āk-ē-, -es- in πυρ-ήκης "with fiery point") unexpected. Thus L. acer "sharp". Substantivized correspondents are found here too: ἄκρς "mountain top", RV (catur)-asri- "four-cornered", ὄκρς "point".

Likewise -ru- in a Caland system can be expected and this is no doubt the reason for a form like RV bhīrú- "fearful", Lith bailūs beside, most importantly, the Lith. -u- stem bajūs "terrible" (< bhoih-u-). The rest of this Caland system is filled out by RV bhīma- "terrible", a good example of "marginal" Caland -mo- and the -es- stem bhiyas-, Av. biiah-, animate and inflected like usás-. In Lithuanian -ru-/-lu- is common as a replacement for -ro-/-lo- in adjectives (see Leskien Bildung d. Nom. 260, Brugmann Grdr² 2.1.385). The only point to be made in this context is that since a large number of inherited -ro- and -lo-

adjectives (perhaps even a majority) are Caland adjectives, the phenomenon described here would serve as an obvious starting point. In no way is it to be assumed that, e.g. bailus and bhīrú- (quite apart from the question of the root vocalism) necessarily point to an Indo European -ru-/-lu- stem.

These complex suffixes motivated within the Caland system are largely to be considered einzel sprachlich in their formation and certainly in their spread. A good case is that of the Latin reflexes of the non-acrostatic u-stem adjectives. It is of course well known that they appear with a complex suffix -ui-, which is clearly not to be separated from -ri- as a complex suffix of the Caland system. We find, for example, Toch A. ārki B ārkwī "white" (both presumably < *arkāui- < h₂erā-uu-i- because of the non-palatalization of the k) beside argu-(ere), Hitt. harki-, araz-at-a-, rīrā-, ἄργυρος, etc. Also Av. uruii-āp- "whose water spreads wide" beside uruu-āp- "id" in compound vs. youru- (h₁uer-u-), RV urú- (h₁ur-u-) = εὐρύς and in Latin itself agui-folium "prickly-leaved i.e. holly" beside acu-dens. We may also compare Armenian meṛk "weak" < meldui- beside Skt. mṛdú "soft" Gk βλαδύς "flaccid" and Latin rollis, which is < mld-i- not mldui- first of all because *mldui- would > *molluis and second because Latin generalizes full and not zero grade in these non-acrostatic u- stems (levis, brevis, tenuis, gravis). In any case the conclusion that

all but imposes itself is that the -ui- of ārkwi, uruii-, aqui-, meŭk and also the normal Latin type is likewise a complex suffix with Caland -u- plus Caland -i- again ultimately to be explained by the mutual implication of these suffixes within the system but which has become productive and a virtual replacement of simple -u- in this one language (vs. the scattered instances elsewhere).

In this case, furthermore, one's impression that the formation, or at least the extension, of complex -ui- is a post-IE phenomenon can be confirmed. A really archaic IE $\hat{g}^u\text{reh}_2\text{-}\bar{u}\text{-}\bar{i}\text{-}$ would of course give Latin $*\text{grāuis}$. The -i- was therefore added to a stem that had already become grāu- < inherited $\hat{g}^u\text{reh}_2\text{-}\bar{u}\text{-}$ which happened in late IE at the earliest. The same point is illustrated by RV jírvri- "old, weak, perishable" beside AV jírvi- "id", yet another formation stemming from the Caland system of $\hat{g}^u\text{erh}_2\text{-}$. The RV form is evidently metathesized from the form preserved in the AV (W-D 1.207; 2.2.488, 859, 915, 919) thus jírvi- > jírvri-. jírvi- itself, however, the original form, requires the development: $\hat{g}^u\text{rh}_2\text{-}\bar{u}\text{-}$ (cf. $\gamma\rho\alpha\upsilon\varsigma$) > Indic jiru-. Only then is the additional Caland -i- added to give jírvi-. Again an inherited $\hat{g}^u\text{rh}_2\text{-}\bar{u}\text{-}\bar{i}\text{-}$ would give $*\text{jírvi-}/\text{jūrvi-}$.

To the already complex -u-i- of Toch. A ārki B ārkwi (cf. again argu-, harkī-) we even find a further -ont- applied in Toch A rātr-ārkvant "red-and-white", a dvandva with argu-i-ont- as the second member. -ont- is involved

in similar complex Caland system suffixes in such Hittite examples as mak-la-nt- (cf. macer, $\mu\eta\kappa\omicron\varsigma$ /Av masah-, macēre), which is in turn reminiscent of archaic Latin macilentus which may, it is true, be made on gracilentus (so E-M s.v. macer). But gracilentus/gracilens (Laev.) itself, beside grac-i-lis/grac-i-lus (Ter. Lucil. fem. gracila) has a cracentes (= *gracentes) beside it in Ennius A.505, preserved in P.F. 46.16. And gracens, in the complete absence of a verb, may perfectly well be taken as a primary adjective in -ont- (-nt-) which implies a Caland system (hence grac-i-lo-).

Other possible examples of -ont- in complex Caland suffixes in Hittite dašsuu-ant- "strong" beside dašsu- "id" < dnsu-. For the phonology of -ns- > -as- cf., with Szemerényi (KZ 73, 76) kua-sk-, iterative of kuen-zi, reflecting gh^hn-skō- whether or not one wishes to follow him in believing that a is the normal outcome of n in Hittite. To dašsu- cf., if not Greek δαβύς "thick (with leaves, hair etc.)", which is problematical phonologically (Frisk 1.351, Szemerényi l.c., Chantraine Dict. étym. 253, Schwyzler 1.307), then at least δauλός < *dnsu-lo- (type ἀργυ-ρος):

δauλoὶ γὰρ πpaπίδωv
δάδκιοί τε τείνουσιν πόροι (Aesch. Suppl. 93f)

"For dense and heavily shadowed the ways of his mind stretch out...", where the subject is Zeus and it is impossible not to compare this mental sense of δauλός "thick, dense" with

e.g., $\pi\upsilon\kappa\iota\nu\acute{o}\varsigma \nu\acute{o}\omicron\varsigma$ (O 461) "close-, dense-minded" cf. $\pi\acute{\upsilon}\kappa\alpha$ ³⁷ "closely, densely". Thus we may assume a $*\underline{d}\underline{n}\underline{s}\underline{-u-}$ "thick" for Greek in any case comparable to $\underline{da}\underline{s}\underline{s}\underline{u-}$ "thick, solid, strong" and $\underline{da}\underline{s}\underline{s}\underline{u}\underline{-ant-}$. Hittite, of course, extends thematic adjectives by $\underline{-nt-}$ as well $\underline{ma}\underline{r}\underline{s}\underline{a-}$ "false": $\underline{ma}\underline{r}\underline{s}\underline{a}\underline{-nt-}$ "false". But $\underline{-u-}$ and $\underline{-ro-/-lo-}$ adjectives so extended, it is being proposed, should be considered either as a special case of this (and cf. $\underline{maklant-}$ to $\underline{macilentus}$ either directly or indirectly) or perhaps even as the starting point.

The $\underline{-es-}$ stems of the Caland system are not excluded from the formation of these complex Caland suffixes either. So for example it is possible to explain $\underline{t}\underline{a}\underline{p}\underline{u}\underline{s-}$ "hot" and "heat" as having a suffix motivated by the co-existence of $\underline{t}\underline{a}\underline{p}\underline{as-}$ and $\underline{t}\underline{a}\underline{p}\underline{u-}$ (the type $\underline{a}\underline{y}\underline{u}\underline{h}$ "life, strength" vs. $\underline{a}\underline{y}\underline{u}\underline{h}$ "lively" is of course a different case). This would account for the adjectival and substantive function side by side, a situation which is rare in forms of this type. In $\underline{c}\underline{a}\underline{k}\underline{s}\underline{u}\underline{h}$, e.g., said to mean both "seeing" (and thus "eye") and "sight" the latter meaning is rare, limited, as it happens, to the 10th Book, and probably secondary. Cf., e.g., 10.59.6:

... $\underline{p}\underline{u}\underline{n}\underline{a}\underline{r}$ $\underline{a}\underline{s}\underline{m}\underline{a}\underline{s}\underline{u}$ $\underline{c}\underline{a}\underline{k}\underline{s}\underline{u}\underline{h}$ $\underline{p}\underline{u}\underline{n}\underline{a}\underline{h}$ $\underline{p}\underline{r}\underline{a}\underline{n}\underline{a}\underline{m}$ $\underline{i}\underline{h}\underline{a}$ $\underline{n}\underline{o}$ $\underline{d}\underline{h}\underline{e}\underline{h}\underline{i}$...

"Restore our eye (> sight) and breath to us..."

$\underline{v}\underline{a}\underline{p}\underline{u}\underline{h}$ "marvelous" and "a marvel" is etymologically totally obscure.

Now $\underline{-us-}$ stems in Vedic are certainly not particularly limited to roots with a Caland system where such formations

(as perhaps tápus-) can perhaps be due to the special relationship between -u- and -es-. There are also forms such as manús- "human" vs. manu-, janús- "birth" vs. janas, etc. and deverbative examples like jayus - "victorious", daksús- "burning" (see in general W-D 2.2.489-91. But dhánus "bow" and párus "joint" are something else entirely; see K. Hoffmann Die Sprache 20.1, 15ff.). The development of these various types, clearly einzel sprachlich, is a separate problem. It is noteworthy, however, that in the case of the only -us- stem that looks inherited (and AV árus- "wound" vs. ON orr "scar" < *arwiz- or *arwaz- is not strictly comparable), a Caland system is involved.

Latin uetus ueteris "old" (invariant inflection for all genders) is an adjective and an adjective only. It is not even legitimate to assume that uetustus provides any evidence for a substantive *uetos in Latin since it is hardly unexpected that an adjective of the unusual shape uetus ueteris should simply be re-characterized by a more normal adjectival suffix. The obvious correspondents of uetus are the Balto-Slavic forms Lith vētūšas OCS vetūxū (uetuso-) which for their part can only be segmented uetus-o-. No Indo European nominal suffix -so- exists. The picture then is an adjective uetus extended by -o- in B-S and partly by -to- in Latin. These forms alone would guarantee an IE adjective uetus "old". A third term to the comparison was added by Szemerényi (ZDMG 101, 204-5 see also Gnomon 43, 668)

who suggested that Sogdian wt^vsn^vy "old" continues Iranian uatu^vša-na-. This can only represent the *uetus-o- of the Balto-Slavic forms further re-characterized in Iranian by a -na-. Thus uetus is surely not the correspondent of Gr. Fétos that has somehow come to be used as an adjective and this far we may follow Szemerényi (but not in his view that uetus itself is < *uetuss < *uetusos).³⁸

In any case uet- has a clear Caland system constituted by the uet-ru- of Gothic wiprus etc., (type bhīru-) uet-es- in Greek Fétos, etc., and the u- stem involved in uetus, etc. This unique case of surely inherited -us-, then, occurs in a Caland system, where its most obvious explanation would invoke the mutual implication of -u- and -es-.

Latin augur also attracts attention in this respect. Surely a much more semantically and formally satisfying solution than the standard one which makes it an original neuter corresponding to RV ójas- would be to compare it most closely with the OPr. -u- stem āucus "increasing" (> "greedy"). Again invoking the fact that this u- stem occurs within a Caland system (u^ugrá-, ójas, ao^vji-iah-, aug-ē(scere)), an original adjective aug-u + s- "bringing increase" of exactly the type uet-u + s- would neatly account for the form and function of this term.

tolerare is usually thought to be remodelled from tollere under the influence of its supposed antonym onerare. But from an opposition onerare: tollere one could hardly expect,

if this were the case, anything but *tollerare. From where is the stem tol- to be extracted at a stage already within Latin? Furthermore, this explanation would lead one to expect "support, bear" in the physical sense to be the earliest meaning and "endure" to be a more recent development. But the opposite is the case. The physical meaning is late and rare. The earliest meaning "endure" is well illustrated in, e.g. Ennius (Ann. 134): Ferro se caedei quam dictis his toleraret, where it is also important that the verb is intransitive. This meaning is exactly that which the Caland system of adjectives derived from telh₂- often is found to have (e.g. Ταλαί-φρων "of enduring mind", τάλας /-αντ- "long-suffering") so that rather than following the inadequate explanation which invokes onerare, it would seem advisable to assume instead another adjective parallel to uet-u+s-, auq-u+s- and, like them, within a Caland system: tel(h₂)-u+s-, where it is, of course, to be remembered in addition that this u-stem is certain for Latin in any case (tolutim, tellus). This tel-u+s- would mean τάλας "enduring" and its denominative tel-u+s-ā- "be enduring", originally intransitive as in the Ennius passage above.

It was mentioned above that marginal -no- is perhaps found as an actual Caland suffix in the tep-no- seen further extended in OIr tened (tepne-et/-t- type Gr. ἀργής / ἀργέτα < h₂râ(r)e-et/-t-³⁹). If so Av. tafnah-(uant-) reflecting a tafnah-(tepnes-) "heat, fever" would show a complex Caland

suffix tep-ne +s-. A parallel complex Caland suffix -re +s- might be assumed for a form like Greek πλήρης "full" (cf. plērus πληρώ in Caland alternation with the -u- of πολύς plou(s)) and the inflection πλήρης / πλήρεος even be the result of an original plēre-es/plēre-s- although it is equally likely that an invariant plē-re +s- (and cf. invariant uet-u +s) when inflected for animate gender could be lengthened in the nominative secondarily. For the nominal function of putative tep-ne +s- vs. the adjectival of plē-re +s- note the double function of tep-u +s- (tapus- "hot", "heat").

We noted above the types -i-ro-, -i-lo-, -u-ro-, -u-lo-, complex suffixes created within the Caland system. A striking distributional characteristic of the marginal Caland suffixes -mo- and -no- is that in a very large proportion of the cases in which they figure in a Caland system at all, -mo- and especially -no- are present only in one of these complex suffixes of the form -i-no-, -u-no- (less frequent), -i-mo-, -u-mo- (less frequent). From time to time they even show signs of a minimal productivity in these shapes. This is the other characteristic which, quite aside from the rarity of -mo- and -no- as "primary" Caland suffixes (i.e. alternating directly with -i-, -u-, -ro-, -ont-, -es-, -ē-) justifies setting them apart as marginal. Examples of -no- and -mo- in complex Caland suffixes:

Lith krūvinas, OCS krŭvīnŭ, beside krū-ro-, krū-ont-

etc., pointing to kruu-i-no-

Greek ἀργυρο- in ἀργιρόεις "bright, white" beside h₂(e)rǵ-i-, h₂erǵ-u-, h₂rǵ-ro-, h₂(e)rǵ-ont- as above

Av, saocina-(uant)- "bright" (of fire) beside RV śuci- "bright", śukrá-, Goth suxra- and perhaps with a complex -i+s- in RV śociṣ- "flame"

Greek πυκνός "close, compact" beside πυκιμήδης and πυκνός

Av, zairina- "weakening" reflecting (anachronistically) < ǵr_h₂-i-no- or ǵer_h₂-i-no- beside -u- (γρᾶῶς), -ont- (ǵarant-/jurat-), -(e)s- (ǵarás, γῆρας/γέρας)

Gr, ἄδινός "crowded, close, thick" (Hom.) beside ἄδρός "thick, solid" (Hdt.) and perhaps an -es- stem in (psilotic) ἄδος Λ.88 "satiety" if this (hapax) is in fact an -es- stem and not thematic (ἄδος τέ μιν ἔκετο θυμόν).

This is also one of a relatively small number of cases (like pl_h₂-i-/ple_h₂-no- vs. pl_{th}₂-u-/pl_{th}₂-no- above in which a root in two (or more) variously enlarged shapes shows a Caland system. For this ǵd- (< sh₂-(e)d-) is probably to be referred to the seh₂- root of ǵw etc. which, in the shape sh₂-(e)t- provides the likely Caland pair L. sat-i-s/sat-u-r (sat-u-ro-).

OCS tĩmĩnú "dark" (tm_h-i-no-) beside YV tā(m)rā-, Av.

təmah-, Ir. teim (temh-i-)

Av. tač-i-na- "running, flowing" beside tači-ap-, RV táku-

Arm. erkayn < duaino- < dueh₂-i-no-⁴⁰ likewise shows a complex Caland -i-no- beside dueh₂-ro- (δηρός, erkar)/duh₂-ro- (dūrus, etc) and duoh₂-i- (doë).

-u-no- in Caland derivatives is rarer. One may point to: RV árju-na- "white, bright, silvery" which is to h₂erâu- as Greek αργυνο- is to h₂(e)râi-

Hom. θάρσυνος "daring" is not likely back-formed from θαρσύνω as Chantraine suggests (Dict. étym. 424), since the other back-formations from -ύνω verbs seem to be nouns in -ύνο- or -ύνη (αἰσχύνομαι, αἰσχύνη, εὐθύνω, εὐθύνης - Chantraine Formation 208). It would seem better taken as complex -u-no- beside the other Caland formations on this root (RV dh₂rs-ánt-, θεροΐτης, etc.)

RV táru-na- Av. tauruna- "young, tender" beside τέρν· ἀσθενές, λέπτον and Armenian t^c_{arm} "young, fresh" < tr_o-mo- another example of marginal -mo- as a primary Caland suffix. (also Albanian trim "spirited"?)

-i-mo- as a complex suffix within a Caland system is virtually limited to a well-known series of Greek adjectives in -ι-μο: Hom. φαίδιμος "shining" (: φαιδρός, Lith. gaidrus), κῦδιμος "glorious" (: κῦδι-άνερα, κῦδρός Hes. κυδνός),

κάλλιμος "beautiful" (καλλί-κομος, κάλλος "beauty", where it is notable that the Caland system shows -λλ- vs. $\check{\kappa}\alpha\lambda\acute{o}\varsigma$ "beautiful" thematic).

So also βριμός·μέγας, χαλεπός (Hesych.) - cf. βρέμη "strength, might" - as if from $\underline{\underline{a}}\check{r}ih_2\text{-}\underline{\underline{m}}\text{-}$ < $\underline{\underline{a}}\check{r}h_2\text{-}\underline{\underline{i}}\text{-}\underline{\underline{m}}\text{-}$ in the Caland system of βαρύς ($\underline{\underline{a}}\check{r}h_2\text{-}\underline{\underline{u}}\text{-}$), βριαρός ($\underline{\underline{a}}\check{r}ih_2\text{-}\underline{\underline{r}}\text{-}$ < $\underline{\underline{a}}\check{r}h_2\text{-}\underline{\underline{i}}\text{-}\underline{\underline{r}}\text{-}$). βρι·βριαρόν and βρί·ἐπὶ τοῦ μεγάλου (cf. βρι-ήπυος) are no doubt de-compositional from $\underline{\underline{a}}\check{r}ih_2\text{-}$ (< $\underline{\underline{a}}\check{r}h_2\text{-}\underline{\underline{i}}\text{-}$) in pre-consonantal and pre-vocalic position respectively.

These $\underline{\underline{i}}\text{-}\underline{\underline{m}}\text{-}$ Caland adjectives show every sign of being on a later chronological level than, e.g. $\underline{\underline{i}}\text{-}\underline{\underline{r}}\text{-}$ or even $\underline{\underline{u}}\text{-}\underline{\underline{i}}\text{-}$. They first of all seem limited, for all practical purposes, to a single language. But what is more important is that whereas one may argue about whether, e.g., rudhi-ra- is a contamination of rudh-i- and *rudh-ra- or an extension of rudhi- by the -ra- which it implies within the Caland system, it is quite clear that only the latter is probable for these Greek $\text{-}\iota\text{-}\mu\text{o-}$ adjectives. In the first place none of them seems to actually have a simple $\text{-}\mu\text{o-}$ beside it in Greek or elsewhere and in addition it is obvious that $\text{-}\mu\text{o-}$ has been added in other cases in Greek to an $\text{-}\iota\text{-}$ that is not even a Caland $\text{-}\iota\text{-}$ (see Chantraine Formation 152-3); e.g. $\acute{\alpha}\gamma\chi\iota$ ⁴¹ "near" (adv.); $\acute{\alpha}\gamma\chi\iota\mu\text{o}\varsigma$ "near" (adj.), $\acute{\alpha}\lambda\kappa\iota$ (πεποιθώς); $\acute{\alpha}\lambda\kappa\iota\mu\text{o}\varsigma$. But even so two things are to be noted. First, a considerable number of examples of this

-ιμος type seem to be conditioned by the fact that the -ι- which is extended by -μο- appears as the first member of a compound (so Arbenz cited by Chantraine l.c.⁴²), whether that -ι- is a Caland -ι- (καλλι-κομος ; κάλλιμος) or not (οψί-γονος "of late birth" ; ὀψιμος "late". This synchronic relation between -ι- in compound and -ιμος even seems to have been automatic enough to allow the back formation of a "Caland compound" ἀλκί-φρων (Sophocles) to Hom. ἀλκιμος , itself extended from the isolated ἀλκί . If -ι- in composition is a conditioning factor in this formation, the Caland system cannot be entirely unrelated.

Secondly, -μο- itself is, after all, a Caland suffix even if a marginal one. The choice of specifically this suffix, otherwise not at all productive in Greek, to extend or recharacterize compositional -ι- again indicates that the process has, in origin, something to do with the Caland system and the interactions of its members, as is already implicit in Wackernagel's Vermischte Beiträge discussion.

The complex -υ-μο- is rare but not limited to a single language. Armenian bazum "much" (-a- class) points to an Iranian *bazuma- (παχύς , RV bahulá-, Av. bazah-) and Hom. ἡδυμος (standardly concluded from the actually transmitted γήδυμος - see, e.g., Chantraine Dict. étym. 406) "sweet, pleasant" to an analogous formation beside ἡδύς , Toch. A swār B swāre.

Similarly, Toch. A orkām B orkamo "dark" may well

reflect a $h_1\text{orq}^u\text{-u-mo-}$ with a complex Caland suffix beside the $h_1\text{orq}^u\text{-ont-}$ of A arkant B erkent "black". One might have assumed instead a pre-form $h_1\text{orq}^u\text{-mo-}$ with $\text{orq}^u\text{mmo-} \rightarrow \text{orq}^u\text{umo-}$ conditioned by the preceding labio-velar. But the secondary CeRC structure of the root (vs. $h_1\text{req}^u\text{-}$ in $\epsilon\rho\epsilon\beta\acute{o}\varsigma$ and $\epsilon\rho\epsilon\mu\acute{\nu}\acute{o}\varsigma < h_1\text{req}^u\text{-no-}$) is reminiscent of the same situation in at least three other Caland u-stems: 1) pelh₁-u- (Goth. filu OIr. il and cf. in particular $\pi\acute{o}\lambda\acute{\upsilon}\varsigma$ with o vocalism as well), 2) the meld-u- of Arm. mełk (<meld-u-i->) vs. mled- in Skt. mradiṽāms in the Caland system of mrđú-, $\beta\lambda\alpha\delta\acute{\upsilon}\varsigma$, $\beta\lambda\alpha\delta\alpha\rho\acute{o}\varsigma$, mollis (mld-i-), and 3) the kort-ú- of Gothic hardus vs. not only $\kappa\rho\acute{\epsilon}\tau\acute{o}\varsigma$ but also the u-stem forms Skt. kratu- and Av. χratu-. The assumption of an actual u-stem (extended by, or contaminated with, -mo-) for A orkām B orkamo therefore at least provides apparent comparanda if not an immediate explanation for the unexpected root structure of the forms. The CeRC of arkant/erkent may then provide evidence of the secondary (but doubtless early) creation of a $h_1\text{orq}^u\text{-ont-}$ (or $\text{orq}^u\text{-ont-}$) beside $h_1\text{orq}^u\text{-u-}$ ($\text{orq}^u\text{-u-}$) much as A swār B swāre (suād-ro-) beside (no doubt original) suād-u- or Slavic *jastrǔ (ōk-ro-) beside ōk-u- seem to be secondarily created Caland variants motivated by the mutual implication of these suffixes within the Caland system. But it is tempting to think that whatever conditioned the schwebeablaut of the u-stem independently conditioned it for the -ont- stem as well. The evidence necessary for a decisive

choice is not forthcoming since there seems to be no other CREC root making a Caland system of derivatives which includes both a -u- stem and an -ont- stem.

As for the factor conditioning the schwebeablaut in these four Caland u- stems (pelh₁-u-/po'h₁-u-, meld-u-, h₁org^u-u-, kort-u-) in the first place, this is a problem which deserves to be studied in its own right and is thus beyond the scope of the present discussion which is addressed more to questions of formation and derivation than to those of inflection. But it may be briefly indicated here that there are a few reasonably clear cases in which a schwebeablauting secondary CERC full grade of the root is associated with amphikinetic inflection.

As opposed to the ghiem- indicated by Av. ziiǎ, zimō "winter" and Latin hiems, Greek χειμῶν "winter" shows a regularly formed amphikinetic nominative but with schwebeablaut - thus gheimōn.⁴³ Similarly, the well-known IE word for "dawn" (ἠώς / αὔω, aurōra, uśāh) is standardly and most straightforwardly reconstructed as an amphikinetic s- stem with a paradigm h₂éus-ōs/h₂us-s-és⁴⁴ and a schwebeablauting full grade h₂eus- beside the h₂ues- of the word for "spring" (Gr. ἔαρ < h₂ues-r⁴⁵, Av. vanri "in spring") and cf. in particular RV vasar-hān- "killing in the morning" and vāsarā- "in/of the morning".

A possible explanation of the schwebeablaut of the Caland u- stem adjectives mentioned above is therefore that

these adjectives were originally amphikinetic in their inflection. This proposal, moreover, tallies well with the fact that the u-stem in the Caland system of nek̂- (νεκρός , *nasauš) looks surely like an amphikinetic nek̂-ou-s and those belonging to the Caland systems of telh₂- (ταλαί-, τάλας) and qerh₂- (γεραρός jarant-/jurit-) may well be telh₂-ou-s and qerh₂-ou-s in parallel fashion, as we have seen.

This proposal claims no more than that u-stem adjectives at one time ran inflectionally parallel to adjectives in -ont- and at least one surely inherited adjective in -oh₂, one of which happens to be a formant belonging to the Caland system in addition, the other not. These adjectives seem originally to have had amphikinetic inflection for animate gender but proterokinetic for the neuter: még-oh₂/mō-h₂-és animate (essentially continued by RV mahā-, mahás) but még-h₂ (nom.-acc. sg. neut. reflected directly in RV máhi). Likewise -ont- stems, not only those that are Caland adjectives but also -nt- participles, follow this pattern. Animate qerh₂-ont-/qrh₂-nt-és is still to be found as such in RV jarant- (γέρων)/jurit-(é) and that the corresponding neuter was of the proterokinetic type is indicated by the widespread -nt neuter nominative-accusative of, e.g., the normal I-Ir. type neuter RV brh-át, Av. barazat beside animate RV brhán, Av. barazō (for *barazas) with animate -ont-s (implying original amphikinetic bherch-ont-) and neuter -nt (implying original

proterokinetic bhergh-nt). The root vocalism of both the animate amphikinetic and neuter proterokinetic paradigms has been consistently levelled to zero in this whole type (cf. further for Skt. rhant-, prśant-, rúśant-). A more isolated example is OIr. lóchet, gen. lóchet, neuter, "flash (of lightning)" reflecting leuk-nt, the substantivized proterokinetic neuter of an -nt- stem adjective (cf. rúśant- "brilliant" for the animate amphikinetic correspondent?)

We propose, then, parallel to amphikinetic animate -ont and -oh₂ vs. proterokinetic neuter -nt and -h₂, an amphikinetic animate -ou- (nek-ou-s, derh₂-ou-s, telh₂-ou-s) vs. proterokinetic neuter -u. Just as amphikinetic nouns are associated with schwebeablaut in some cases (cheimōn, h₂eus-ōs as above), so also we might assume that the amphikinetic animate paradigm of the u- and nt- stems in question here could also have this characteristic. Thus the CERC of Toch arkant-/erkent- (h₁orcu^u-ont- vs. the h₁regu^u- of ῥεφος Goth ricis and ῥεμνός) would be a case of schwebeablaut comparable to cheimōn (although the o-grade remains mysterious). This suggests in turn that the pelh₁-u- of Goth filu, OIr. il and the polh₁-u- of Greek πολύς (a specially conditioned replacement of pelh₁-u-) continues in its root shape that of the animate inflectional form of the adjective while the pleh₁-u- of L. plūs (see above) continues that of the original neuter (pléh₁-u-/plh₁-eu-s). Likewise meld-u- (Arm. melk < meldu + i-) shows a root shape at home in the first instance

in the animate paradigm (vs. non-schwebeablauting mled-) and h₁org^u-u- (Toch orkām/orkamō < h₁org^u-u+mo-) vs. h₁reg^u- is of the πολύς type, as is kort-ú- (Goth. hardus) vs. ḱret- (κρέτος , kratu-).

The normal Greek and Indo-Iranian u-stem adjective paradigm in -u-s/-eu-(o)s, βαρύς /βαρέF-(os)=gurúh/guró-(h), is thus seen to reflect the original neuter paradigm most directly with the characteristics of the animate correspondent eliminated except in rare cases (γρηΐ , *nasauš, schwebeablaut of πολύς). In addition it is the zero grade of the oblique cases of the neuter proterokinetic type that has been generalized throughout. A rare exception like Avestan youru- (h₁uer-u-) vs. εὐρύς and Skt. urú- (h₁ur-u-) is instructive in that it presents a non-schwebeablauting form of the root which may also point to the proterokinetic (neuter) paradigm.

The Hittite situation with respect to u-stem adjectives is interesting. The standard descriptive statement made (e.g. J. Friedrich Hethitisches Elementarbuch I 50-1) is that "open" inflection (-uuaš) is characteristic of substantives and "closed" inflection (-auaš) characteristic of adjectives. But in the first place, this distribution is less clear in Old Hittite than later (Kammenhuber Hdbch. der Orientalistik §40.2 for examples of -u-/-au- apophony in nouns). Furthermore it is worth noticing that u-stem adjectives show -au- more consistently in the dat.-loc., abl., and instr. than they do in the genitive. So, for instance, huisu- "alive"

has abl. huisavaz but gen. huisuuaš[✓], parku- "high", a clear Caland u-stem (brhánt- etc.), has dat.-loc. pargauē and abl. pargauaz but gen. parkuuaš[✓], and idalu- "evil" has dat.-loc. idalauī and abl. idalauaz but gen. HUL-uuaš[✓] (= idaluuaš[✓]). The reverse (i.e. gen. in -au- but dat.-loc., abl., or instr. in -uu-) does not seem to occur. If the genitive has -au-, then all the oblique cases of the singular have -au- (as in tepu-, panku-, and perhaps kelu-). In addition there are some adjectives which show -uu- throughout the paradigm (e.g. hallu- "deep" gen. halluuaš[✓], abl. halluuaz). In short there are three patterns: -au- throughout, -uu- throughout, and genitive -uu- vs. dat.-loc., abl., instr., -au-. One might think of explaining all three types by starting from a proterokinetic paradigm. Then the type tepuš[✓]/tepauas[✓]/tepauaz would reflect this directly (R(é)-us/R(z)-éu-) while the halluš[✓]/halluuaš[✓]/halluuaz type would show a complete generalization of the nom.-acc. stem form and the huisuš[✓]/huisuuaš[✓]/huisavaz a partial generalization of the nom.-acc. stem form affecting the genitive only. Alternatively one might assume that the halluš[✓]/halluuaš[✓]/halluuaz type reflects an acrostatic type and explain only the other two as divergent reflexes of the proterokinetic paradigm. But in neither case is there an explanation for the fact that it is only the genitive that is affected by a less than complete generalization of the nom.-acc. stem in -u-. There is apparently no case in which it is only the dat.-loc. or only the abl. or only

the instr. that undergoes this innovation and conversely there seems to be no case in which any of these three "adverbial" cases differs from the other two. This cannot be completely coincidental.

Starting with an amphikinetic paradigm, however, helps explain the apparent coincidences. It would have originally had nom.-acc. $R(\acute{e})\text{-ou-}$, gen., etc. $R(z)\text{-u-}\acute{e}s$ and locative $R(z)\text{-}\acute{e}u$. This paradigm eliminated the -ou- of the nom.-acc. quite possibly already in IE except for a few relics substantivized early ($\text{nek}\text{-ou-s}$, $\text{telh}_2\text{-ou-s}$). The resulting paradigm (-u-s , -u-m , $\text{-u-}\acute{e}s$, $\text{-}\acute{e}u$) inherited into Hittite and with the adverbial cases built on the original endingless locative accounts for the $\text{-uu-}\acute{a}s/\text{-au-}\acute{i}$, $\text{-au-}\acute{a}z$ type directly while the $\text{-au-}\acute{a}s/\text{-au-}\acute{i}$ type can be explained as the result of the combined pressure on the genitives in $\text{-uu-}\acute{a}s$ exerted by the adverbial cases in -au- (< locative) and the original neuter (< proterokinetic) paradigm with -au- throughout the oblique cases in the first place.

The complexities do not end here, however. At least one u- stem and one ont- stem stand outside the system suggested by this hypothesis. Beside the Caland u- stem adjective from kret- (κρᾶτῦς , ultimately reflecting the proterokinetic - neuter most directly, kort-u- with "animate" schwebeablaut vs. κρᾶτῦς , κρέτος) there is a (probably amphikinetic) abstract noun in -u- in Indo-Iranian (RV krátuh , instr. krátvā/krātuā , dat. krátve , gen. krátvah and Av. xratuś ,

instr. χραβᾱ). The -u- formant here is of course difficult to separate from that of the u-adjective but their functions are not directly reconcilable.

Similarly beside the -ont- stem adjective of the Caland system of bergh- (brhant- etc. vs. bəṛəzi-, parku-, etc., as above) there is an apparently amphikinetic noun bhergh-ont- (or bhrgh-ont- like the adjective?) in Tocharian A (kom)- pärkant/B (kaum)- pirko "(sun)rise" where again the -ont- must have something to do with the -ont- adjective but is functionally distinct. This Tocharian -nt- stem abstract (beside, in fact, an -nt- stem adjective in this case) within a Caland system is in turn reminiscent of the OIr. -nt- stem abstracts (only semantically de-adjectival) of the type (Thurneysen GOI, 167) lethan "broad" (< plth₂-no- as above): lethet "breadth" (< pleth₂-nt or < plth₂-nt with root vocalism remodelled from lith- to leth- under the influence of lethan) or tiug "thick" (< teq-u-) vs. ticet "thickness" (remodelled from teget, which does occur once, < teq-nt) or trén "strong" (< treg-s-no-) vs. treisset "strength" (< treg-s-nt) or ἐλαχύς "small" vs. Irish lagat "smallness". In these cases the -nt- abstract stands beside an adjective with a Caland suffix.

The relation of bh(e)rch-ont- (noun) to bhrgh-ont- (adjective) and kret-(o)u- (noun) to k(o)rt-u- (adjective) is problematical. It is not easy to parallel this situation in which a single formation (same root, same suffix, same

inflectional pattern) has both functions and all that can be contributed here to a solution is the descriptive statement that both of these double-function formations happen to be from roots with intrinsically adjectival semantics (bhergh-, kret-; and this can also be said of the Irish type lethet, etc. above as far as the etymologies of the examples are clear). On the other hand -u- and -nt- formations from roots of other semantic types are adjectives only.

One more complex Caland type should be mentioned here. In at least two clear cases a suffix -bho- serves to re-characterize Caland adjectives. In Greek we have ἄργυρος "silvery white" (Hom.) beside ἀργυρός and in Latin acerbus (akro-bho- or akri-bho-) "sharp, bitter". -bho- itself figures practically not at all as a Caland suffix in its own right. Examples like Lith. līebas "thin" beside leĩlas "id".., OIr. linr "weak", and Ir. lían "tender" (?) or again Lith. raĩbas "speckled" (cf. OIr. ríabach "brindled"?) beside raĩmas "motley" and raĩnas "striped" do not inspire much confidence.

The general picture presented by this variegated class of complex Caland suffixal formations is thus largely indeterminate. On the one hand we have some cases which are definitely best described as actual contaminations of parallel Caland derivatives. So, for example, the adjective uet-u+s- "old" and the other forms belonging to this type

(perhaps tep-u+s "heat, hot", tel(h₂)-u+s "enduring", etc.) can hardly be interpreted as anything but a contamination of -u- and -s- stems within a Caland system. On the other hand we have seen that the -i-mo- Greek type, where it concerns Caland formations, is surely to be considered a case of renewal of a Caland -i- adjective by the superaddition of a further Caland adjectival suffix -mo- which, as a marginal Caland suffix like -no-, figures largely in this role.

But aside from these relatively clear cases, the situation tends to be completely ambiguous. Although rudhirá- is often considered to be a contamination of the rudhi- of RV rudhi-kra and the wide-spread -ro- adjective which stands beside it, there really is no way to absolutely exclude the possibility that rudhi-rá is a recharacterized version of rudhi- in the same way that κύνδμιος is a recharacterized κύνδ- (άνειρα). In the same way Hom. πυκινός may be a contamination of Hom. πυκνός with Hom. πυκλ-(μήδης) but could just as well result from a renewal of -i- by -no- completely independent of the -no- of πυκνός itself. We may compare αργινός-(εἰς) beside ἀργί-(πους) in the absence of an *αργ-vo-. Consequently πυκνός beside πυκινός, far from requiring the assumption of syncope for the former (with Szemerényi Syncope 82-3), would seem rather to suggest that πυκινός is an "expansion" of πυκνός (whether by contamination or by re-characterization of πυκλ-), created

within the epic language as a metrically useful variant of $\pi\upsilon\kappa\upsilon\acute{o}\varsigma$.

Also ambiguous in this way are the suffixes of the type -ru- (RV bhīrú-), -ri- (L. acer etc.), and various others of those mentioned above. But whether they are contaminations or recharacterizations or partly one and partly the other, these complex Caland suffixes made up of two or more simple Caland system members would seem to owe their existence to the special relationship of mutual implication and predictability that exists among them.

Finally another formation to which one's attention is drawn in the context of the Caland system in general and complex Caland suffixes in particular is Latin -idus. In the first place there is the well-known distributional characteristic of this formation. It occurs typically beside nouns in -ōs and verbs in -ē- and thus the Latin -ōs, -ēre, -idus system may be expected to represent a productive, specifically Latin expansion of a sub-part of the Caland system as a whole. But the form of the suffix and its original position within the Caland system are less clear. Judgments about such a productive formation must of course be made on the basis of what is suggested by the isolated representatives of the type - the examples which are not likely to have been formed only within Latin beside a pre-existing -ōs or -ēre or both.

In fact there does seem to be a pattern to be discerned

here. Of the isolated representatives of the -idus type, there are at least three with clear etymologies - foedus "terrible", crūdus "raw, bloody", and nūdus "naked". As expected foedus and crūdus are from roots which furnish Caland systems elsewhere. foedus, reflecting bhoih-idho- (> bhoi₁idho- > bhoi₁dho-), belongs to the Caland system of Lith. bajūs (bhoih-u-), RV bhīrú- (bhih-ro-) and bhiyās- (bheih-ōs) and crūdus (kruh₂-idho- > kruu₁idho- > crūdus) to that of Av. χruui- (dru-), χruuant-, χrūra-, Greek κρέας, Lith. krūvinas, etc. But what is more interesting and more useful for determining the exact position of -idus within the Caland system is the fact that both of these Caland systems include marginal -mo-: RV bhīmá-, Av. χrūma-. This indicates that -dho-, insofar as it figures in the Caland system (and has become productive as such in Latin), is to be considered a marginal Caland suffix itself functionally and distributionally comparable to -mo- and, in its complex form -i-dho-, formally parallel to (mildly productive) Greek -l-₄₀-. As a Caland suffix, -dho- is thus also comparable to -bho- in that it is a marginal member which occurs rarely if ever as a Caland suffix in its own right. It is virtually limited (like -bho- in ἀργυρός, acerbus) to complex suffix formation within the Caland system - specifically in the form -i-dho-. It may be that simple -dho- occurs in a couple of cases. For russus "red" the reconstruction h₁rudh-dho- (and cf. rubidus) is more probable than h₁rudh-to- since Caland

-ē- verbs simply do not have -to- participles in Latin. Similarly maestus beside maerēre, miser may well be from mais-dho- with -sdh- (or rather -zdh-) > Italic -s^g- > Latin -st- as in hasta "spear" < ghazdhā (cf. Goth. gazds "goad, sting"). If so, the position of -dho- within the Caland system is exactly analogous to that of -m₂-. But neither of these examples is sure. While h₁rudh-to is certainly inadvisable for rusus, it cannot be excluded that the preform is h₁rudh-s-o-, a thematic adjective derived from the Caland s-stem represented, e.g., by έρειθος. Formally one may compare, up to a point, OCS rusū (h₁roudh-s-o-) "reddish". maestus is actually a slightly surer case of simple -dho- if maerēre and miser are taken as mais-ē- and mis-i-ro- respectively, pointing clearly to a Caland system. But the root has fundamental a vocalism and is not found elsewhere, which does not increase one's confidence. Furthermore, miser might be a secondary formation in -ro- derived from a thematic mis-o- and thus continue a mis-e-ro- (cf. δόλος "trick": δολερός "deceitful, treacherous" etc.). In this case maerēre could likewise be denominative from a thematic mais-o- or, better from the point of view of maestus, an independent characterized present in -ē- on the same root, in which case mais-to- would be a possible -to- participle (type taedēre/taesum est).

If one chooses not to accept such examples of possible simple -dho-, the position of this suffix becomes more like

that of -bho- within the Caland system as a whole. But in either case -dho- would appear to be in origin a marginal Caland suffix which, in the complex form -i-dho-, became productive and was extended in Latin beside -ē- and -ōs, two other members of the Caland system.

This brings us to nūdus and, once seen that -dho- is a Caland suffix of sorts which occurs in at least two other clearly old cases beside -mo-, the various forms of the Indo-European word for "naked", which is pivotal in several respects for the present discussion, appear in a somewhat new light.

The picture presented by the various forms is somewhat complicated by the fact that some forms have apparently undergone various taboo deformations. The shape of the root is of course neq^u-. This root shape is reflected undisturbed by Lith. núogas and OCS naq^u (both < nōq^u-o-), RV nagná-, Hitt. neku-mant-, OIr. nocht / W noeth (noq^u-to-), and the Germanic forms (e.g. Goth. nagaps, OIc. nökkuidr). For Avestan ma^yna-one could start with a neq^u-no- (supposing that this pre-form continues unchanged in RV nagná-) and assume a taboo dissimilation of naq-na- to maq-na-. But it is probably preferable, given that taboo deformations have to be assumed in any case, to begin with a unitary preform neq^u-mo- behind both Hitt. neku-mant (neq^u-mo-nt- cf. mak-la-nt- as above) and the Indo-Iranian forms which will thus represent, on the Avestan side, a taboo metathesis of naq-ma- (< neq^u-mo-) to maq-na- and for Indic an assimilation of naq-ma- to naq-na-. The

assumption of a neg^u-mo- thus has two advantages. It economically requires only a single pre-form rather than neg^u-no- beside neg^u-mo- and furthermore allows some comparanda. For now we have a -mo- beside the -dho- of Latin and Germanic which, as we have seen, can be paralleled - at least for Latin (crūdus : χrūma-, foedus : bhīmá-). Furthermore indirect evidence of -mo- is to be had in Greek γυμνός and Armenian merk.

The Greek form is relatively complicated in any theory. But at least as good as any alternative is the assumption that from original neg^u-mo- Greek has, as an isogloss with Iranian, a metathesized neg^u-no- which is, in turn, further metathesized in Greek to g^uem-no- > g^uum-no- > γυμνός. The Hesychius form λυμνός, if it is to be taken seriously at all, in any case must represent yet a further re-arrangement of γυμνός (see Frisk, Chantraine s.v. γυμνός).

Armenian merk is difficult as well. But even at the outset it is important to note that, like Hittite, it has e vocalism (see below). Assuming again neg^u-mo- as the starting point and a dialectal IE taboo assimilation to meq^u-mo- (cf. the opposite assimilation in RV nagná-) the presence of pairs like krū-mo-/krū-ro-, dns-mo- (RV dasmá-)/dns-ro- (dasrá-), bhī-mo-/bhī-ro- (cf. RV bhīrú-), sidh-mo-/sidh-ro-, g^urih₂-mo- (βριμός)/g^urih₂-ro- (βριαρός) within the Caland system could easily produce here what is in any case the only probable immediate predecessor of Arm. merk (i.e. meq^u-ro-)

beside meq^u-ro-, itself a deformation of neq^u-ro-. The situation is analogous to that of suād-ro- in Tocharian and ok-ro- in Slavic. In any case meq^u-ro- is in fact the best assumption for the pre-form of merk. The only real question is how meq^u-ro- itself is to be explained. The process just outlined is a proposed answer to that question.

Benveniste (Rev. ét. arm. 10, 187) supposed a complicated phonological development for merk in which -q^ud- > -rk- in the pre-form *meq^u-do-. But an immediate problem is that a reconstruction meq^u-do- assumes a probably non-existent suffix and furthermore cannot account for the initial m- in the first place (the "comparison" of Av. ma^yna- is hardly legitimate). Secondly the phonology is anything but compelling. Benveniste proposes that the Armenian development of du- > rg- > (e)rk- is somehow parallel to a development of -q^ud- > -q^ur- > -kr- > -rk-, which is fine once the -q^ur- (or -kr-) stage is reached, but is completely unconvincing in its main claim that d > r after q^u just because d > r before u. An explanation of the clearly required meq^u-ro- is certainly preferable.

All in all what we have in any case, is two series of forms of this word. On the one hand there are the forms with e root vocalism (either sure or possible) and the marginal Caland adjectival suffix -mo-: neq^u-mo- ultimately the pre-form of Hitt. neku-ma-(nt-), Arm. merk, Av. ma^yna-, Ved. nagná-, and Greek γυμνός. For neku-ma-(nt-) neq^u-mo- is

straightforward. For the Avestan and Armenian forms the initial m- is best taken as the result of taboo deformations of a pre-form which likewise had an m- and thus neg^u-mo- is again indicated. One may wish, although (as pointed out above) it is unnecessary, to assume that neg^u-no- is to be supposed for Ved. naṅá- in addition to the neg^u-mo- that is required anyway. This will make little difference in the last analysis since -no- is a marginal Caland suffix comparable to -mo- in any case. Greek γυμνός (and λυμνός for *γυμνός - Chantraine and Frisk s.v.) must also belong to this neg^u-mo/(no)- series no matter what the actual course of the deformations.

On the other hand we have in Balto-Slavic and Celtic forms with o vocalism of the root and non-Caland suffixes: nōc^u-o- in Lith nūogas, OCS načū and noc^u-to- in OIr. nocht, W. noeth where the -o- : -to- is reminiscent of the pair leuk-o- "white, bright" (λευκός) : leuk-to- "id" (OHG, OS liht) again outside the Caland system. We shall return to the Germanic and Latin forms below.

The situation which we find here (Caland adjective beside thematic adjective with o grade root) is one which we have seen before. The clearest case in h₁rudh-ro-/h₁rudh-i- beside h₁roudh-o-. But there are others as well.

We have seen that this is a possible explanation of Greek πολ (λ)ο- (if this reflects polh₁-o-) beside plh₁-u- and pleh₁-u-/pelh₁-u-. Then πολύς would owe its o vocalism

to the thematic non-Caland by-form much as OCS rusŭ pre-supposes an s-stem h₁roudh-s- within the Caland system of h₁reudh- which likewise probably owes its o vocalism to non-Caland h₁roudh-o- (OCS rudŭ).

Similarly the root kreuh₂- has not only a Caland system (krŭ-rá-, krui-, cruent(us), etc.) but also an o-grade thematic adjective krouh₂-o- which > Gmc. hrawa- > OHG hrō, OE hréaw, OIc hrār, OS hrā.

So also beside AV śvit-ra, AV spiti- (kuīt-ro-/i-) a kuoīt-o- is assured by OCS světŭ and is presumably also to be assumed for RV śvetá-, AV spaēta-.

From the root keuh- "hollow" (same root as keuh- "swell"?) we have Caland adjectives meaning "hollow": keuh-ro- > keua-ro- > Arm. sor "hollow" (cf. the further extended Latin caverna < keua-ro-nā); kuh-no- > Arm sun "lacking" (< "empty, hollow"). But beside these forms we have the thematic o grade forms L. cavus (< kouos < kouh-o-) "hollow, cave" and Greek κόος "hollow, cavity" with κῶος (kōuh-o-) "cave, hollow" as well where the lengthened grade is comparable to that of nōc^u-o- in the B-S word for "naked". Just as the o grade of Caland formations polh₁-u- (πολύς) and h₁roudh-(e)s- (rusŭ) seems to have been introduced from the corresponding non-Caland o grade thematic formations, here too Greek κοῖλος / κόϊλος (< κόφιλος as if < kouh-i-lo-), a typical complex Caland formation, owes its o grade to κόος.

The "naked" word fits the same pattern: Caland

neq^uλ-mo/(no-) and Armenian meq^uλ-ro- ultimately conditioned by the inner dynamics of the Caland system vs. non-Caland nōq^uλ-o- and *noq^uλ-o- (if Celtic noq^uλ-to- may be taken to be a renewal of this).

Turning to the Germanic and Latin forms we may first recall that Latin -i-dho- is a complex Caland suffix and, more specifically, that -dho- corresponds, in the shape -i-dho- to marginal Caland -mo- in two other clear cases. It then becomes clear that noq^uλ-i-dho-, the probable pre-form of Latin nūdus, and presumably OIc nökkuidr as well, is of the type κοίλος - i.e. a sort of contamination of non-Caland nōq^uλ-(t)o- and expected Caland *neq^uλ-i-dho- which is to neq^uλ-mo- as kruh₂-i-dho- (crūdus) to kruh₂-mo- (Av χrūma-). The Germanic forms of the type Goth. nagaþs, OHG nackut, OE nacod may then either represent a slightly different contamination, that is noq^uλ-o-dho-, or (slightly better since -dho- other than in the complex shape -i-dho- cannot surely be counted on, as remarked above) they may represent noq^uλ-o-to- with a complex non-Caland -o-to- (beside B-S -o-, Celtic -to-) and cf. Goth liuhaþs (leuk-o-to-) beside OHG, OS lioht (leuk-to-) and Greek λευκός (leuk-o-).

5. The Caland system and secondary formations.

Up until now, a Caland system has been presented here as a series of equally primary derivatives made on a given root by means of a fixed set of derivational formants. But

there are a number of cases in which it is clear that we must recognize a certainly secondary Caland system - i.e. the derivation of parallel adjectives in -i- and/or -ro-, etc. and/or an -s- stem noun and/or a stative present in -ē- not from a root but from an already constituted stem.

So from melit- "honey" (Gr. μέλι, Hitt. milit-) Hittite has a denominative u-stem adjective maliddu-/miliddu- "sweet" but beside this a stative present (in this case stative-inchoative) milit-e-([√]s). The important thing to notice is that milites[√] means not "become honey" but "become sweet". Clearly on the model of a primary pair of the type parku- "high": parkeš[√] "become high" on a root with basically adjectival semantics, the characteristic Caland replacement (or alternation) pattern was extended to miliddu- "sweet", a u-stem adjective belonging to a later layer, and the result is milites[√] "become sweet" (see Watkins TPS, 1971 86-7)

Similarly beside the root noun h₃o/ep-s (L. ops) we find an n-stem further extended by a small Caland system: s- stem in RV áp-n-as "possession, wealth" and Av. afnah-; -ont- adjective in Hitt. happinant- "rich" (h₃e/op-en-ont-) and also perhaps in Latin opulens (Szemerényi Glotta 33, 1954 266-82); -ē- stative in happin-e-([√]s) "become rich" where again the (inchoative) stative makes it especially clear, quite apart from its occurrence beside an -s- stem and an -ont- stem, that a secondary Caland system is involved. Like milit-e-([√]s) "become sweet", happin-e-([√]s) pre-supposes the

function of the adjectival (in this case -ont-) formation with which it alternates, a pre-supposition generalized from primary Caland systems to this secondary one. There need be no perplexity over the fact that happin-e-(\check{s})- does not mean "become a possession" and the view that happin- is to be interpreted as an adjective (Szemerényi Syncope, 146) is thus completely unnecessary.

The IE adjective for "new" is the basis for a small secondary Caland system. Beside neue-nt- (Latin nūntius < nouentio- < neue-nt- + iio-), with -nt- recharacterizing the already adjectival thematic formation we find neue-ro- in nouerca (neue-ro- + kā) to which one must compare Greek νεαρός < νεφα-ρο- probably derived most directly from νέα (as in ἐνν καὶ νέα) and cf. ῥυπαρός "dirty, greasy" (Hippocrates) derived from ῥύπα "dirt", formally a neuter plural which is the only form of the word found in Homer. The thematic masculine singular ῥύπος is attested only after Homer. Armenian nor reflects a neue-ro- as well.

The -eh₂- stem adjective "great" meġ-oh₂- (animate)/meġ-h₂ (neuter), as above, likewise has been recharacterized by a Caland system of secondary formants: Gk. μεγάλο- < meġ-h₂-lo-, Hitt. mekki "much" < meġ-h₂-i, and RV mahānt-/Av mazānt- (certainly < meġ-oh₂-ont- if one takes seriously the two trisyllabic scansion of RV nom. sg. mahān- cf. AiGr I, 49) all show that the Caland system is in fact a secondary one with the various formants added to the -eh₂- suffix.

Latin ingens "huge" also belongs here as a formation parallel to mahānt-/mazānt-. It reflects $\hat{m}\hat{a}-h_2-ont-/-nt-$, the oblique stem of animate amphikinetic $\hat{m}\hat{e}\hat{a}-oh_2-/\hat{m}\hat{a}-h_2-$ further suffixed by -ont- and shows the usual Latin generalization of the zero grade allomorph of the -nt- suffix.⁴⁶ The -u- stem of this (secondary) Caland system is perhaps to be assumed for OIc. mjok "very" if this reflects $\hat{m}\hat{e}\hat{a}-h_2-u$ (other explanations of the form are thinkable). RV mahas-/Av mazah- "greatness" probably provide the expected -s- stem and the -ē- stative is present as well in Hitt. makk-e-(s)- "become much" whose root vocalism, interestingly enough, differs from that of mekki- and perhaps can be taken as a "morphological" zero grade in a form that then would indirectly reflect $\hat{m}\hat{a}-h_2-\bar{e}-$.

This small number of examples is intended only to show that the phenomenon of secondary Caland systems exists, and is certainly not exhaustive. A certain number of additional cases can be added but, as is to be expected when dealing with what looks like an extension of an archaic and only marginally productive pattern, the examples become fewer and less sure fairly quickly.

But associated with the general notion of Caland systems as sets of parallel secondary formations is a much more basic question. We have just now spoken of cases in which we have descriptively a series of derivatives consisting of root plus alternating Caland formants (type bhrgh-i-/bhrgh-u-/bhergh-es-, etc.) as primary as opposed

to clearly secondary cases like those of the type meq-h₂-i-/meq-h₂-lo-, etc. But at the outset these cases were somewhat more exactly defined as those in which a given root has a series of parallel derivatives which are all equally primary. In short one may wonder (and this is perhaps the basic problem of the Caland system) whether in fact the so-called "primary cases are not themselves ultimately to be considered secondary formations made on root nouns and, in a couple of cases, apparent root adjectives. For there are a number of good cases - perhaps enough to make the distributional fact significant - in which there occurs beside a "primary" Caland system a suffixless nominal formation functioning either as a noun or as an adjective. Such cases are the following:

kreuh₂- "injure" (cf. Av. xru-nar- "injuring men" and RV mitra-kru- "injuring Mitra"; see J. Kellens Les noms-racines de l'Avesta 379 and 387-8 with further references makes a root noun quite possibly originally of the o/e resultative type (J. Schindler BSL 67 (1972), 36). Just as the root noun uok^u-/uek^u- "word" names the result of the action designated by the verbal root uek^u- "speak" so krouh₂-/kreuh₂- "bloody flesh, gore" refers to the result of kreuh₂- "injure". This root noun is attested only with generalization of the radical zero grade which arises regularly in the oblique (originally e-grade) cases of o/e root nouns from roots of the structure (C) (R) e R (C) in the manner described by Schindler (op. cit.). Thus we have

OIr. crú, Av. xrū-, Slavic kry. Beside this root noun there is a well-developed Caland system of course (RV krū-rá-, Av. xruui-, xrū-ma-, L. cru-ent-(us), Gk. κρέ(F)ας, Lith. krūv-i-na-, etc.). For the question of whether Caland systems are primary formations or secondary derivatives of root-stems this example is of great importance and argues for the latter. It is clear that kruh₂-ro- etc. "gory, bloody, grisly" are, on fairly decisive semantic grounds, derivatives not of the root itself which is basically verbal ("injure") but of the (resultative) root noun krouh₂-/kreuh₂- ("gore, raw or bloody flesh").

Similarly the root dueh₂-/deuh₂-, as a verbal root weakly attested (Bartholomae's ²dav- "entfernen" for Avestan?), makes a root noun (e/zero type) dueh₂-/duh₂- "distance" (Schindler *op. cit.* 37) whose accusative dueh₂-m is reflected by Greek δῆν "for long, long ago" and Hittite duān and whose oblique stem duh₂- appears in Hittite tūa "far" and tūaz "from afar; for a long time". It is not really possible to decide whether the Caland system here (dueh₂-ro-, duh₂-ro-, dueh₂-i-no-) is derived from the root or the root noun. But this is in any case another good example of the distributional pattern root noun/adjective beside Caland system.

From ueih- we have both the root noun (with generalized zero grade) uih- "strength" (L. uis/uim, Gr. (F)¹ίς) and a small Caland system. This includes the wide-spread original -ro- adjective uī-ro-/ui-ro- (I-Ir uīrā-, Lith vyras/L. uir

OIr. fer etc.) "strong" > "hero, warrior, man" in which the uī-/uī- alternation may possibly be explained as reflecting the paradigmatic allomorphs uī-s (uīh-s)/uī-és (uīh-és) of the underlying root noun (but cf. dueh₂-ro-/duh₂-ro- from the root noun dueh₂-/duh₂-és as above). An s-stem noun for this Caland system is provided by RV vāyas < ueih-es- and Z. uī-r-(és)⁴⁷ < uīh-s-.

The Caland system of bherôh- "high" (brh-ant-, park-u-, pärk-är, etc. as above) has a root-stem beside it assured by Av. barəz- (see Kellens, *op. cit.* 282, 353 ff.) and OIr bri/gen. breg < bhrôh-s/bhrôh-os. The Irish form is a root noun meaning "hill". Similarly the Avestan correspondent has the meaning "mountain" but is also a root adjective "high" (Bartholomae AIW s.v. ²barəz- but see Kellens *loc. cit.*).

Another root adjective is Avestan mas- "great" < mak- "thin; long, tall, high". To account for Gk. μάκος vs. μάκρος Kellens (*op. cit.*, 356) sets up a root of the shape meh₂k-/mh₂k- and is thus forced to assume that Av. mas- is a contamination of the mak-ρός root with that of μέγας. But the Greek forms in no way justify the reconstruction meh₂k- and in fact it is Av. mas- itself which shows that this root simply has fundamental a vocalism. Greek μακ-ρός and Av. mas- reflect mak-, and μάκος is an s-stem with lengthened grade root, a type which is well enough paralleled in Greek (e.g. ῥῆδος vs. ἔδος, μήδεα vs. μέδεα) even for s-stems within a Caland system (γῆρας vs. γέρας as above; see

J. Schindler in Flexion und Wortbildung, ed. H. Rix, 267). We have here then an adjectival root mak- which forms both a root-stem (adjective) and a Caland system (mak-la-nt-, mac-ē-re, μάκος, etc.).

Beside the Caland system constituted by νεκρός vs. ΝΕΚΥΣ / *nasauš "dead" > "corpse" is found a root noun nek- in Latin nex "murder, destruction" and the Hesychius gloss ΝΕΚΕΣ · ΝΕΚΡΟΙ · ἀνία

For "year" there is a root noun reflected in Hitt. uitt- (and perhaps in Gr. (εἰς) νέωτα, adv. "next year" < neuo-uōt-m). The Caland system belonging here consists of the s-stem φέτος, the adjective uēt-u + s- "old" (Latin uetus, B-S uēt-u + s-o-), and a second adjective uēt-ru- "of a year" > "yearling" (Goth. wīþrus), both adjectives with complex Caland suffixes as described above.

Although there are a number of (minor) problems connected with the family of L. spēs it is highly probable that spēs/spem is a root noun. Beside this are the Caland adjectives RV sphi-ra' "lively"/Lith. spérus and the -s- stem presupposed by L. spe-r-es/spe-r-ibus, parallel to ui-r-es/ui-r-ibus beside root noun uis.

The Caland system of bheih- "fear" (bhih-ru-, bhih-mo-bhih-es-, bhoih-u-, bhoih-i-dho- as above) can also be included here. The root noun is supplied by RV bhī- "fear"

For κρέων / κρέοντιος (Pindar, etc.; Hom. κρείων with metrical lengthening) "ruler", it is unnecessary to assume

secondary -nt- inflection of an original comparative matching RV śrévas-, Av. sraiaha- (see Chantraine 580, Frisk 2.12 with references). Κρῆοντι- which has no demonstrable comparative function, may be more straightforwardly taken as an original Caland -ont- adjective kreih-ont- "glorious" beside krih-ro- "glorious, beautiful" in Av. sri-ra-/RV (a)-sri-ra'-. The root noun here is RV sri- "well-being, glory, beauty" perhaps matched by an Avestan sri- (see Schindler Wurzelnomen⁴⁸, 47).

Finally, we may point to the RV root noun suc- "flame, glow" (with a possible Avestan correspondent in the Gothic I.sg. sūcā - see Schindler, op. cit., 46) beside RV sukra- "bright" and suci- "id", the pair which first proved that Caland's "law" was at least Indo-Iranian.

A fairly large number of additional examples of the pattern root noun beside Caland system could be added but are problematical in one or more respects. A detailed analysis of these cases cannot be carried out here, but we may point some of them out and indicate the nature of the problems associated with them.

A probably inherited -s- stem is reflected by Gr. νέφος "cloud", OCS nebo "heaven", Hitt. nepis (as if nebh-es) "sky", etc. Beside this there is the -ro- formation nbh-ro- of RV abhra- "(thunder) cloud", Av. aβra-, forming what looks like a Caland pair with substantivized -ro- adjective. Here too there may be root noun if RV nom. pl. nābh-ah (with

nabh-ah? see Schindler Wurzelnamen 29-30) means "clouds".

But there are verb forms from this root as well: Gk. συν-νέφει "clouds over"/ ξυν-νένοφε "is cloudy" (first in Aristophanes) and Av. aiβi, naptīm (absol.) "wetting"/napta- "wet, moist" (Schindler loc. cit.). The Avestan forms suggest that nebh- itself means "moisten, wet" which in turn is an argument in favor of the usual interpretation (Chantraine 748, Frisk 2.309) of -νέφει/-νένοφε as a back-formation of some sort since the verb has the function of a virtual denominative to νέφος, νεφέλη. But if there is a verbal root nebh- "moisten" from which is derived the root noun "cloud", it cannot be completely excluded that nbh-ro- is a deverbative -ro- noun (type ξυρόν /ksurá- as above) and not a Caland -ro- adjective at all. This, as we have already seen, is a general problem with assuming substantivized -ro- adjectives from verbal roots.

The root leip- "smear, stick (to)" but also apparently "cheat, deceive" (Mayrhofer KEWAi 3.60, Frisk 2.126f., Schindler Wurzelnamen, 41) forms the root noun RV rip- "deception; deceiver". The -(e)h₂- stem collective of a Greek root noun from leip- "smear" is perhaps to be found in the substantive λίπα "grease, fat" (Hippocrates). Homer has a λίπ', always elided, which seems to be an adverb. But original nominal function for λίπα is suggested not only by the form in Hippocrates but also by the already Homeric adjective λιπα-ρός "oily" - λίπα "fat, oil"; λιπα-ρός

"fatty, oily" = ῥύπα "dirt": ῥυπαρός "greasy, dirty".

A Caland system is detectable here but the situation is not completely straightforward. A u-stem adjective is provided by RV ripú- "deceptive" (: rip- "deception"), a -ro- adjective (ultimately) by λιπαρός, and an s-stem by RV répas- "blot, stain" (rip-/lip- "smear") and λίπος "fat". RV rip-rá- "stain, dirt" is problematical in the usual way - is it a substantivized -ro- adjective or a deverbative -ro- noun from rip- "smear"? What we seem to have here is not an inherited Caland system but independent formations in Greek and Indic with formants belonging to the Caland set. On the Indic side ripú- was apparently derived from rip- "deception" after the semantic shift of "smear" to deceive" (cf. German anschmieren "cheat") while répas- may be deverbative < rip-/lip- "smear" in the first place. On the other hand λιπαρός is clearly a properly Greek formation and λίπος is probably also best taken as a relatively late derivative/recharacterization of the root noun whose collective is λίπα because of its root vocalism. Thus while we may, by taking a comparative overview, speak of a Caland system in this case (-u-, -ro-, -es-) beside a root noun (λίπ(α), rip-), a stricter description might present the situation as a marginal independent continuation of an inherited derivational pattern: the derivation of -u- and -ro- stem adjectives and -es- stem nouns (etc.) from root nouns.

Some further possible examples are special cases of a sort in that beside the root noun in question we have only

one member of a putative Caland system:

RV ūrj- "energy" and Av. varəz- "vigor", reflecting I-Ir ur̥ǵ-, IE urhǵ- represent a root noun beside which Avestan shows the "classical" Caland -i- stem adjective in composition: e.g. varəzi.dōiθra-. The -arə- of this adjective vs. the -arə- / -ūr- of the root noun is not quite clear, but cf. Av. varəzaiiant- vs. RV ūrjāyant- and the irregular pair parəna-/pūrṇa- and see Kellens, op. cit., 361-4 and Schindler, op. cit., 13 both with further references.

RV tan- "extent", root noun nomen actionis to tan- "extend" (Schindler, op. cit., 22) is standardly connected with RV tan-ū- "thin", Latin ten-ū + i- (tenuis).

Other such examples of root noun beside a single Caland formation are of the type RV túj- "ardor, agitation" (Schindler op. cit., 23) vs. túq-ra- "wild"? (PN), múd- "joy" vs. AV mud-ra- "joyful", and several others.

Finally we cannot leave the question of Caland systems and secondary formations before saying a few words about the problem of the analyzability of -ro- into -r + o-. That -ro- is so analyzable is a view which has been well-known at least since Benveniste's Origines (passim). For Benveniste a pair of derivatives like dō-ro- (δῶρον, Arm. tur, OCS darŭ) vs. dō-no- (L. donum, Skt. dānam- op. cit. 13) points to an r/n stem *dō-r-/dō-n- with both stems thematicized even though no IE language actually attests an r/n stem from deh₃- as such. This methodology characterizes much of

Benveniste's treatment (op. cit. 3-22 for examples). It is consistently assumed that a -ro- formation (especially beside a -no-, etc. but even alone in many cases) is in principle to be analyzed -r + o- and furthermore that this -r is to be identified with the -r of r/n heteroclytic nouns.

Benveniste makes no explicit and consistent distinction between Caland -ro- on the one hand and -ro- in non-Caland function (non-adjectival) and non-Caland derivational distribution (not beside -i-, -u-, -ont-, -ē-, -es-, etc.) on the other. There is no essential difference for him between dō-ro-/dō-no- and σοβαρός/σεμνός (op. cit. 33- ultimately Caland type κυδρός/κυδνός, plērus/plēnus). Both are said to provide evidence for otherwise unattested r/n stems. The implications of this view for the ultimate interpretation of the Caland phenomenon are considerable: it suggests that -ro- adjectives, a formation central to the Caland system, are in the last analysis derivatives in -o- of r/(n) stems.⁴⁹

But this point of view is demonstrably wrong. In the first place it is impossible to deny that the formant -ro- had more than one function and belonged to more than one derivational pattern already in PIE. On the one hand, as pointed out several times above, a category of -ro- stem nouns must be recognized. So RV ksu-ra'/Gk. ξύρον (cf. ξύω), δῶρον/tur/darū (δω-, dā-, etc.), ῥόδρος "dawn" (cf. RV vārdhate probably), τάφος "ditch" (θάπτω), L. stuprum

(stupere/ΤΥΠΩ as above), etc. An entirely distinct category is the large group of (Caland) -ro- adjectives and this distinction is certainly already PIE. There is no reason to think that the -ro- substantives are substantivized adjectives and, indeed, such a view is practically excluded by the fact that these -ro- substantives do not belong to Caland systems. Further distinguishing the two groups is a distributional factor. The nominal type dō-ro- is virtually restricted to verbal roots while systems of Caland adjectives are certainly not. If, therefore, we must identify two descriptively different -ro- formations already for PIE, there is no reason to think that the two have the same pre-PIE source. In fact, we have, if anything, grounds for expecting their ultimate origins to be different. This, in turn, means that it is not possible to assume that -ro- (and -no- etc.) suffixes can always be interpreted without further ado as thematicized -r- (and -n- etc.) stems. At best one type of -ro- formation may ultimately have this explanation. But it is entirely possible that it is correct for neither.

The consequence of this line of reasoning is that the relationship, if any, between r/n stems and the Caland system (-ro- adjectives in particular) must be investigated on the basis of actually occurring r/n stems. Putative derivatives⁵⁰ of r/n stems are illegitimate evidence.

On this basis, if we are to believe that -ro- Caland adjectives are really thematic derivatives of r/(n) stems

(see especially Bader in Mélanges Benveniste, 19ff. who carries the Benveniste approach to extremes) we have the right to expect at least a few roots to provide both an r/n stem and a Caland system. This is not the case. There are practically no roots which have both. The best example is that of ued- which has both the r/n stem uod-r/uod-n- "water" and a weak Caland system (-ro- adjective ῥόδρος, Skt. udra-, etc. if this designation for various water animals really is a substantivized adjective ud-ro-; -es- stem in Hesiod's dative ῥόδε). But even this example may be a mirage. For beside this r/n stem there exists a root noun continued by Hittite uit- (cf. dat.-loc. uiti = ued-i). As we have seen, a Caland system beside a root noun is not unexpected and consequently we may prefer to see here a root noun conditioning (or serving as the derivational basis of) a Caland system beside an r/n stem which happens to exist as well in this untypical case. We need not recognize any special derivational connection between the Caland system and the r/n stem itself at all. The important point, at any rate, is that Caland systems simply do not co-occur with r/n stems that are actually attested as such in some IE language.

In short, the available evidence suggests quite clearly that r/n stems derivationally have nothing to do with -ro- adjectives in particular and Caland systems in general. If -ro- is to be segmented -r+o- at all, this can be done only on the basis of a few cases in which a Caland system is

identifiable beside an r-stem (not an r/n stem or at least not demonstrably an r/n stem):

- Av. aogarə (aug-r) "strength": RV ug-ra'; Av. aoj'-ah-;
 OPr. aūq-us; L. aug-ē-sco; etc.
 Gr. αἰθήρ : αἰθή-ος ; OIr. aéd (aidh-u-); αἰθήρος ; etc.
 Gr. κῆδερ·πένθος (Hesych.): κηδι-κράτης; κῆδος, -εος
 Gr. κύαρ "hole" (Hippoc.): ΚΟ(Γ)-ι-λο-; Arm. sun "lacking"
 Gr. εἰθαρ (adv.) "straightaway": ἰθύς ; RV sidhra'; sidhma'-
 Av. atarš (< atr + s) "fire": O Ir. áith (ati-) "oven", L.
āter "black" (ātro-)
 RV usar-, Gr. αἴηρ (h₂us-ér): ἡώς/usas- etc. < h₂eus-ōs-/
h₂us-s-; RV usra'-
 Av. hanarə (< sen-r) "without": L. sine (< sen-i); RV san-u-
 (tār); etc.
 Av. tačarə "course": tači-āp-; RV tak-u-; etc.

It is clear that r-stems as derivational bases for -ro- adjectives are much better supported than r/n stems. But even the interpretation of -ro- as r-stem + -o- cannot be shown to be certain. The evidence is scanty and in some cases precariously attested (e.g. κῆδερ) or unsure (is L. ater "black" sure to be a thematic adjective derived from atr "fire"?). There is also a conspicuous lack of exact word equations, a suspicious circumstance in such a presumably archaic category and we must therefore not exclude the possibility of certain marginal and obscurely motivated back-formations. All in all a derivational process r-stem \Rightarrow -ro- adjective is only a

possibility while $\underline{r}/(\underline{n})$ stem \Rightarrow -ro- adjective is not even possible.

NOTES

¹This form (hapax) seems not to exist. See A. C. Pearson, The Fragments of Sophocles, sub Fragment 651.

²Risch, in the new (1974) edition of Wortbildung der hom. Sprache, gives an overview, for the Greek material, more similar to the outlook adopted here.

³Bader gives a reference to Benveniste, Origines, 98-9 here. But Benveniste's own view of Caland -i- is that it is to be identified with the formant of i-stem simplicia of the type πόσις 'well-fed', σπόσις 'slippery character' (Origines 75, 80). Benveniste's interpretation is very unlikely (while Bader's is too vague and hypothetical to admit of verification or falsification) because the primary-looking formations which he compares are not made from roots which have Caland systems.

⁴We must leave aside here the question of the exact relationship between the =u- adjectival formant of tep-u- and the -(e)u- of verbal formations from this root (RV dabh-n-uv-anti/ Hitt. tep-n-u-zzi, RV a-dbh-u-ta-). This question has been treated by H. Koch, Indo-European Denominative verbs in -nu-, Diss. Harvard 1973.

⁵Whether or not this means that all are actually primary in the strict sense--i.e. deradical (see below).

⁶The long i of this Caland compound adjective is problematical (cf. RV gabh-i-ra- vs. Av. Yaiši- and see below).

⁷Complex r/n stems (i.e. having a formant of the shape -C_{er}-/-C_{en}-) were probably inflected proterokinetically for the most part. See Schindler, "The Ablaut of the IE r/n-stems," in Indo-European Studies II (ed. C. Watkins), esp. § 3.7, pp. 221 ff.

⁸Where the simplex form fully expectable for Latin appears in compound as well. From an IE point of view we might rather expect -petōr for a bahuvrihi in the first instance.

⁹Nothing can be concluded from the river name Fal. ofetios (oufentios), Vetter 243.

¹⁰On the phonology H. Rix, MSS 27.

¹¹Laroche, RPh 48.2 (1968) 242-3 would like to refer L. arguere to Hitt. arkunai- and consequently separate both from h₂erg- (Hitt. harkī-). This cannot be absolutely excluded, but the -u- stem member of this Caland system is not in doubt in any case (cf. arj-u-na-, ἀργ-υ-πος and see below).

¹²J. Schindler suggests to me that raj-at-á- is a vrddhi formation derived from *rj-at- (h₂rg-nt-) after the loss of initial h₂-.

¹³Clear examples are Arm. cer 'old' (as if < ġern₂-o- beside an extensive Caland system for this root) and Goth. diups, etc. (< dheub-o- beside Lith. dubus, Toch. A tpär/B tapre (dhub-ro-). But in this second case it is significant that Tocharian has an o-grade thematic formation in A top/ B taupe (dhoub-o-), a type which is paralleled beside a Caland system (see below).

¹⁴ But it is a possibility with important consequences (see below) that tuyala was made from tuya only within the history of Hittite.

¹⁵ Pokorny's *kar-tu- (IEW 531) is arbitrary.

¹⁶ A suggestion of J. Schindler.

¹⁷ On the reconstruction of the root shape K. Hoffmann, forthcoming (reported to me by J. Schindler).

¹⁸ Frisk, IF 56, 113 ff.

¹⁹ dhubh-u- 'dark' as here, dhub-u- 'deep' (Lith. dubùs) below, h₂eug-u- 'increasing' in OPr aūgus and, ultimately, Latin augur (see below).

²⁰ Concludable as the original nom. sg. form.

²¹ Note πῑαρός but πῑεῖρα, certainly two independent formations having no direct connection diachronically or synchronically.

²² δῑα<diu-iā < diu-ih₂ is not the feminine of a thematic diu-o-, of course.

²³ In MSS 6 (1955) 35-40, K. Hoffmann showed that there is an IE possessive suffix -Hon-/ -Hn- and tentatively suggested that Greek μελ-αν- is to be reconstructed mel-Hn-. Although it can scarcely be doubted that Hoffmann's suffix is to be assumed, this particular suggestion is unsatisfactory. In the first place, since -Hen- stems are denominative (secondary) formations, this interpretation would require a root noun *mel-. There is no evidence for this root noun. Secondly, it would be the only paradigm in Greek (or elsewhere) which shows a generalized zero grade of -Hon-/ -Hn-.

²⁴J. Kellens, Les noms-racines de l'Avesta (Wiesbaden 1974) 379, with note 4.

²⁵See R. Schmitt, Folia Linguistica 4, 179-81 on supposed O. Pers. *ardufiya-.

²⁶Other hysterokinetic collectives are pointed out by J. Schindler, Indo-European Studies II, p. 221: Hitt. utne/ utnijaš (-ēi/ -ij-ós), Slavic stems in -me (-mēn cf. non-collective, -mn), and quite possibly Hitt. pašduer (-uēr), a putative collective of -ur/-uen-. Cf. also L. Cerēs as a possible hysterokinetic s-stem collective (an interpretation also suggested by Schindler).

²⁷Tellūs itself more or less excludes an o-grade tolu-.

²⁸See Szemerényi, Syncope, 256 for another suggestion.

²⁹But see Anttila, Schwebeablaut, 147.

³⁰Szemerényi has recently (KZ 88 (1974) 1 ff.) devoted an article to πολυ-/πολλο -. The major conclusions are:

1. IE *polu- is out of the question from the start and reflects pl(h₁)-u- "either by assimilation from *palús or by dissimilation from *palús."

We can only agree that an actual, inherited IE *pol(h₁)-u- is not to be assumed and that this adjective, as far as Greek and Indo-Iranian are concerned, had a stem plh₁-u- originally. But a post-IE re-arrangement of the inherited form is by no means ruled out.

2. For πολλο- the various analyses (see op. cit. for references) based directly on IE preforms (poluo-, polno-, polio-, fem. poliā, pol-lo-)

are ruled out either by phonological (cluster treatment, set root treatment) or morphological arguments.

3. The only remaining explanation (the Thurneysen-Schwyzzer view by which a πολυλο- arose on the model of μεγα-/μεγαλο - and was then syncopated) is also brought into serious doubt by Szemerényi (op. tit. 8 ff.). Schwyzzer had assumed that the collocation μεγάλας τε και *πολέφος led to the creation of a fem. sg. stem πολυλᾱ-. We may note that this version of the explanation is practically indispensable since it is only some of the members of the πολύς paradigm that have been influenced. A purely paradigmatic remodelling provides no explanation for the fact that *πολυλος seems never to have been created.

Szemerényi then goes on to show at great length that the assumed collocation does not exist as such in Homer (op. cit. 11) and that there is only one example of any sort of co-occurrence of πολύς and μέγας even in a looser combination (loc. cit.) until post-Homeric texts.

4. Szemerényi's own solution is that the stem πολλο- is ultimately of the type (phonologically) Attic στερρός vs. Hom. στερεός, or γέννα beside γενεά or Myc. kuruso, beside χρούσεος. That is, just as στερεός apparently > στερεός/ στεργός > στερρός, Szemerényi suggests that *πολεFα, the original regular neuter plural y-stem form (the member of the paradigm which is statistically preponderant by Szemerényi's count), first prematurely lost its -F- (presumably pre-dialectally) and the resultant *πολεα > πολεα/ποληα > πολλά. The πολλά neuter plural, thus produced, then served, in Szemerényi's view, as the starting point for the creation of the unambiguously thematic members of the paradigm as we have it.

But this solution seems no more satisfactory than the others:

1. We have the problem of the total uncontrollability of the initial claim that intervocalic $-F-$ was lost in $\pi\omicron\lambda\epsilon(F)\alpha$ so early (fast-speech form?).

2. More serious is the fact that while, e.g., $\sigma\tau\epsilon\rho\rho\acute{o}\varsigma$ or $\gamma\acute{\epsilon}\nu\nu\alpha$ occur only in addition to $\sigma\tau\epsilon\rho\epsilon\acute{o}\varsigma$ and $\gamma\epsilon\nu\epsilon\acute{\alpha}$, $\pi\omicron\lambda\lambda\acute{\alpha}$ has somehow succeeded in evincing completely its fuller variant $*\pi\omicron\lambda\epsilon\alpha$ (1) even though the pressure for its preservation would have been at least as great and, (2) despite the fact that the $-\epsilon\omicron\varsigma > -\iota\omicron\varsigma$ development is demonstrably recent in $\sigma\tau\epsilon\rho\rho\acute{o}\varsigma$ (etc.) while the hiatus is at least as old as the one assumed for $\pi\omicron\lambda\epsilon(F)\alpha$.

3. What really rules out the Szemerényi view, however, is the following consideration. If the development in the neuter plural was $*\pi\omicron\lambda\epsilon(F)\alpha > \pi\omicron\lambda\epsilon\alpha/\pi\omicron\lambda\iota\alpha > \pi\omicron\lambda\lambda\acute{\alpha}$, we certainly have to expect that at the same time (or at least as an immediate consequence) the development would have been the same in the other $-\epsilon F +$ vowel members of the paradigm. Thus gen. sg. $*\pi\omicron\lambda\epsilon(F)\omicron\varsigma > *\pi\omicron\lambda\iota\omicron\varsigma > *\pi\omicron\lambda\lambda\omicron\varsigma$, dat. $*\pi\omicron\lambda\epsilon(F)\iota > *\pi\omicron\lambda\iota\iota > *\pi\omicron\lambda\lambda\iota$, masc. nom. pl. $\pi\omicron\lambda\epsilon(F)\epsilon\varsigma > *\pi\omicron\lambda\iota\epsilon\varsigma > *\pi\omicron\lambda\lambda\epsilon\varsigma$, etc. And no matter how inordinately important the neuter nom.-acc. plural may be thought to have been, it is impossible to see how it could have triggered a switch of $*\pi\omicron\lambda\lambda\epsilon\varsigma$, etc. to $\pi\omicron\lambda\lambda\omicron\iota$, etc. It is equally compatible paradigmatically with both and the type pl. $*\pi\omicron\lambda\lambda\epsilon\varsigma$, masc. sg. gen. $*\pi\omicron\lambda\lambda\omicron\varsigma$, dat. $*\pi\omicron\lambda\lambda\iota$, etc. were presumably already there. Putting it another way, a heteroclytic $\pi\omicron\lambda\acute{\upsilon}\varsigma/\pi\omicron\lambda\acute{\upsilon}$ vs. $\pi\omicron\lambda\lambda\omicron\iota/\pi\omicron\lambda\lambda\acute{\alpha}$ has no conceivable advantage over the (synchronically) heteroclytic $\pi\omicron\lambda\acute{\upsilon}\varsigma/\pi\omicron\lambda\acute{\upsilon}$ vs. $*\pi\omicron\lambda\lambda\epsilon\varsigma/\pi\omicron\lambda\lambda\acute{\alpha}$ which is to be expected at some stage in the first place.

Summing up, it is possible that Szemerényi's solution provides an explanation for the gemination in the πολλο- stem (although even in this respect there is room for serious reservations, as pointed out above). But for the thematic character of the stem, it is an insufficient view. Therefore, we prefer to take the o grade root and thematic formant as interdependent and assume a pol(h₁)-o- beside the Caland system of this root, a distribution which can, as noted above, be paralleled (and see further below).

³¹Strictly speaking, -ερο- is not simply a Greek equivalent of -ro-. Aside from the difficult cases ἱερός and ἐλεύθερος where the -ερο- is inherited, Greek -ερο- adjectives are secondary formations proper to Greek itself.

1. The best-represented derivational sub-group is that of -ερο- adjectives which are derived from thematic nouns, e.g. φογερός : φόγος, δολερός : δόλος, θαλερός : θολός, θέμερος : θεμούς· διαθέσεις, γοερός : γόος, νοσερός : νόσος, δροσερός : δρόσος, φοβερός : φόβος, μογερός : μόγος, τρομερός : τρόμος, τροχερός : τροχός /τρόχος, etc.

More examples could be added. In some of these cases one might consider a derivational pattern -έω verb: -ερο-adjective (e.g. φοβέω : φοβερός), but this is unnecessary. In all such cases at least one other possibility is open as well. The obvious analysis of this type is -e- (thematic vowel) + -ro-.

2. Some -ερο- adjectives are derived from thematic verbs: λαρός (< λαφε-ρο-) : (ἀπο)-λαύει, ναρός (ναε-ρο-) : νάει. Other possible examples are derivationally ambiguous. The de-thematic type is clearly the starting point. From here -ερο- has been generalized, but within strict limits.

3. -es- stems. The synchronic "ξ-stem" of the normal Greek paradigm -ε-ος, -ε-ι, -ε-α, -ε-ων, etc. (the animate compound forms) provides the point of contact. This derivational type is assured by κρυερός: κρύος and (inasmuch as -έω;-ερος need never be assumed) κρατερός: κράτος. Other probable examples are possibly ambiguous. E.g. can it be absolutely excluded that θαλερός is derived from θάλος/ (ἀμφι-) θαλής rather than from ἔθαλον?

4. -η- aorists. The pattern is demonstrated by τακερός: ἐτάκην and σφαλερός: ἐσφάλην. On the η/ε see below. Again ambiguous cases arise. Is σταθερός from ἐστάθην or from (εὖ)-σταθής (itself probably built on ἐστάθην) ?

5. Finally, a couple of -ερος adjectives can only be described as root noun derivatives. τρυγερός: τρύξ, φλογερός: φλόξ (φλόγεος is not necessarily evidence for a *φλόγος). Ambiguous cases here are πλακερός (from πλάξ or πλάκος?) or στυγερός (from Στύξ or στύγος or ἔστυγον?).

These are the main outlines of the situation, but certain details have been omitted. I plan to go into them elsewhere.

What is interesting, in any case, is that -ερο- has been generalized in Greek only to formations which, from an IE point of view, have something to do with the Caland system: -es- stems, the -ē- stative, and root nouns (see below). In particular the -η- aorist derivatives in -ερο- are probably to be considered especially closely associated with the -η- aorist participle in -ε-ντ-, thus constituting a sort of marginal "secondary" Caland system (see below) of the type -ε-ντ- (< -ē-nt-): -ε-πο-.

³²See J. Schindler in Flexion und Wortbildung (ed. H. Rix).

³³Schindler, op. cit.

³⁴J. Kellens, Les Noms-racines de l'Avesta, 212 ff. presents arguments against uši- as a locative but also goes on to point out various textual problems associated with ušidam- and in the end prefers to recognize an usadā- "qui donne des sources".

³⁵The Balto Slavic Forms sometimes compared (OCS zeti, Lith. žentas, and especially Latv. znuōts = γυνωτός 'kinsman') may well be from a different root.

³⁶W. Winter, Evidence for Laryngeals² 192. See also Schindler, Die Sprache 15 (1969) 145-6.

³⁷Greek has a number of examples of an adverbial formation in -α beside Caland-type adjectives. Thus κύμα:κυμα -/κυμνός, κάρα : καράς/κατερός, etc. The etymology of this -α formant is entirely ambiguous, but for the cases in which it alternates with Caland suffixes -nt is perhaps the best choice.

³⁸And even so the segmentation getus-o- would remain the only real possibility.

³⁹Secondary de-thematic formation in nom.-acc. -et-/oblique -t- entirely parallel to -eu-/ -u-: see J. Schindler, "On the Greek type hippeus," IE Studies II (ed. C. Watkins).

⁴⁰According to a suggestion of J. Schindler.

⁴¹Unless perhaps āyxt does, in the last analysis, continue a Caland -i- adjective (neuter in adverbial function) beside the -u- stem of, e.g., RV amhu- etc. as above.

⁴²Arbenz (Die Adjektive auf -IMOS, Diss. Zurich 1933) deserves credit for observing that several of the oldest-looking -ιμος adjectives occur beside compound forms in -ι- (κάλλιμος, κύδιμος, ἄλκιμος) and for making the obvious connection between the -ι- of -ιμος and Caland -i- (op. cit. 10).

Certain other views of his, however, are not to be retained:

1. That -μο- as an adjectival suffix has no direct correspondents outside Greek ("Was soll also hiebei ein Suffix -μος zu suchen haben, das zudem auch durch das Idg. keine Stütze findet?" loc. cit.).

2. The consequent hypothesis that the suffixal complex -ι-μο- is originally a hyperchoristic form (type Πάτροκλος vs. Πατροκλῆς) of a name in -ι-μ... (e.g. Κυδί-μος, Καλλι-μένης--op. cit. 11 ff.)

We prefer, noting that -μο- is a Caland suffix, to consider Greek -ι-μο- parallel to -i-ro- and -i-no-.

⁴³I am grateful to J. Schindler for pointing out to me both the phenomenon and this example.

⁴⁴See J. Schindler, Die Sprache 13 (1967) 200 ff.

⁴⁵The non-vocalization of the initial laryngeal in Greek is problematical.

⁴⁶This suggestion, first made long ago (see Walde-Hofmann s.v. for literature) deserves more consideration than it has received. Perhaps once it is clear that $\overset{\circ}{m}\hat{g}-h_2-$ is the fully expectable oblique stem of the adjective for 'great' $\overset{\circ}{m}\hat{e}\hat{g}-oh_2-$ / $\overset{\circ}{m}\hat{g}-h_2-$ neuter $\overset{\circ}{m}\hat{e}\hat{g}-h_2$ / $\overset{\circ}{m}\hat{g}-eh_2-$, an -ont- / -nt- renewal of this stem entirely parallel to $\overset{\circ}{m}\hat{e}\hat{g}-oh_2-$ -ont / -nt- will not seem so strange.

⁴⁷ This type of (synchronic) plural formation uir-ēs (cf. spēr-ēs and ultimately aed-ēs) will be studied elsewhere.

⁴⁸ Das Wurzelnomen im Arischen und Griechischen, Diss. Wurzburg 1972.

⁴⁹ Leading to the attempt (Benveniste, Origines, passim but especially Bader in Mélanges Benveniste, 19 ff.) to analyze the formants of the Caland system into "heteroclytic" elements.

⁵⁰ Benveniste makes illegitimate use of other supposed types of r/n stem "derivatives" too. So, for example, he reconstructs an r/n stem *lip-r-/ lip-n- on the basis of λιπαρός/λιπαίνω (Origines, 18). To segment λιπαρ-ο- in view of λίπα, however, is questionable at best and one need only consider (already Homeric) λευκαίνω 'make white' (:λευκός) to conclude that an -αίνω verb is insufficient grounds for presuming that a given n-stem ever actually existed.